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**Project Evaluations
and Recommendations for
1988-1989 Biennium
and
1986-1987 Biennium
Status Report**

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RENEWABLE RESOURCE DEVELOPMENT
and
WATER DEVELOPMENT PROGRAMS

Project Evaluations and Recommendations for
1988-1989 Biennium

and

1986-1987 Biennium Status Report

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

JANUARY 1987

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INTRODUCTION

The Water Development Program was established in 1981 to allow the state to take a more active role in water development in the face of declining federal participation. This program was a major commitment by the State of Montana to promote water development and to target the following areas:

1. rehabilitate state-owned dams;
2. assist conservation districts in the implementation of water reservations;
3. investigate hydropower development potential in state-owned dams;
4. promote offstream and tributary storage;
5. promote joint state, tribal, and federal involvement in project development;
6. develop a loan and grant program for water development; and
7. provide for administrative expenses.

This report addresses these major areas and focuses on the loan and grant program. The loan and grant program has three major parts: grants, loans under \$200,000 funded by general obligation bond proceeds, and loans over \$200,000 funded by coal severance tax bond proceeds.

CHAPTER 1

THE WATER DEVELOPMENT PROGRAM - GRANTS AND LOANS UNDER \$200,000

A. Program Description and History

The Water Development Program was established in 1981 by the Montana Legislature to promote and advance the beneficial use of water, and to allow the citizens of Montana to achieve full use of the state's water by providing grant and loan financing for water development projects and activities. Projects and activities must be water related and may be for feasibility work, demonstration projects, or construction projects. Eligible proposals include rehabilitation of irrigation projects, dam or reservoir construction, control programs for saline seep, groundwater investigations, development of water-based recreation facilities, streambank stabilization and other erosion control programs, development of water supply, water treatment, or rural water systems, and development of gravity sprinkler irrigation systems. Public entities and private individuals, partnerships, and corporations are eligible to apply.

B. Program Funding

The funding source for the water development grant program is the coal severance tax. The program receives .625 percent of the gross proceeds of the tax and resource indemnity trust interest income each biennium. These funds are disbursed as they are received to approved projects based on their priority ranking. Loans for water development are available to projects with repayment capacity from the proceeds of Montana Water Development General Obligation Bonds. Loans are offered at the interest rate at which the state bond is sold. In 1984 that rate was 8.71 percent, and 1985 rates were 7.22 percent and 6.92 percent.

C. Program Administration and Project Review Procedures

The Water Development Bureau of the Water Resources Division in the Department of Natural Resources and Conservation (DNRC) administers the Water Development Program. The DNRC develops the application form and solicits proposals from the agricultural community, local governments, irrigation and conservation districts, state government, and the university system. All grant applications and loan applications from public entities are submitted to the DNRC in the even-numbered years prior to each legislative session. Each proposal must include information to enable technical, economic, financial, and environmental assessments. The Department evaluates the proposals and solicits technical and financial review assistance when appropriate. Following the assessment review, feasible projects and activities are ranked by the Department using established program and financial need criteria. A funding priority and funding amount recommendation is then prepared for consideration by the Water Development Advisory Council appointed each biennium by the governor in accordance with Section 2-15-22, MCA. After the Council's review, the Department makes a recommendation to the governor, who in turn makes the final recommendation to the legislature. Legislative approval is required for all grants and for all loans to public entities.

When the legislature passes an appropriation bill for the program, Department staff begin to work with project sponsors on implementation and a contract is entered into between the project sponsor and the Department. Each contract includes a detailed scope of work with a completion schedule and budget. Funds are disbursed as they are available and according to the project schedule. Sponsors are required to submit quarterly and final project reports which are used along with field visits to monitor project progress and completion. Loan sponsors are required to submit annual financial reports on the funded system during the life of the loan.

Loans to private individuals, partnerships, and corporations may be approved by the Department Director and application may be made throughout the biennium. Applicants are provided application forms, and proposals are reviewed for technical and financial feasibility. Availability of funds for approved projects is contingent on the availability of state bond proceeds. The Department plans a state bond sale each year to make funds available for private loans on an annual basis.

D. Project Ranking and Funding Recommendation Procedures

The Department ranks feasible projects and develops funding priority and funding level recommendations for the legislature. These priorities reflect the specific criteria and preferences stated by law for the use of water development funds. These criteria are:

- 1) The project optimizes public benefits and enhances public resources
- 2) The project fully utilizes water, and promotes conservation and efficient use of the resource
- 3) There is need and urgency for the project
- 4) The project is part of a family farm operation
- 5) The project uses reserved water
- 6) The project is a water storage project.

The Board of Natural Resources and Conservation and the Water Development Advisory Council have adopted several other criteria for the ranking system, primarily to make the water development and renewable resource programs compatible. These criteria are:

- 1) The project has potential for statewide application
- 2) The project has not previously received funds
- 3) The project does not take prime agricultural land out of production
- 4) Agricultural preference

Funding priority is determined by how well a project scores under these criteria.

Once the priority of projects is established there is a recommended grant amount developed for each project as follows:

1) Construction projects with repayment capacity, such as a community water or sewer project, can receive a grant of 25 percent of the total project cost up to \$50,000 as a grant. Consideration is also given to the financial capability of the project sponsor. This is done to give credit to an entity which has taken on a heavy debt burden to solve its problems. The maximum project cost or request considered is \$200,000. Larger requests are recommended for funding from the Coal Severance Tax Loan Program. Once the funding level is established consideration is given to the viability of the project. If the recommended grant is less than the request, the remainder is provided with a loan recommendation. If a project's priority is such that it will not receive a grant, the project sponsor can take the recommended grant amount as a loan instead.

2) Projects with no repayment capacity may be recommended for up to 100 percent funding.

3) No project is recommended to receive more than a \$100,000 grant because of extreme competition for these funds.

E. 1986 Grant and Loan Applications for Funding in FY88-89

Seventy-three grant applications for water projects and activities were received and ranked in 1986 for funding consideration by the 1987 Legislature. Graphs 1 and 2 on the following page show the number and types of projects that were considered, and the number of applications submitted by different types of applicants. As shown by the graphs, 29 percent of the projects were for irrigation, and conservation districts submitted the most applications, closely followed by private entities, state

agencies, and universities. Only seven of the applications from public entities were considered for both a grant and a loan and none requested just a loan.

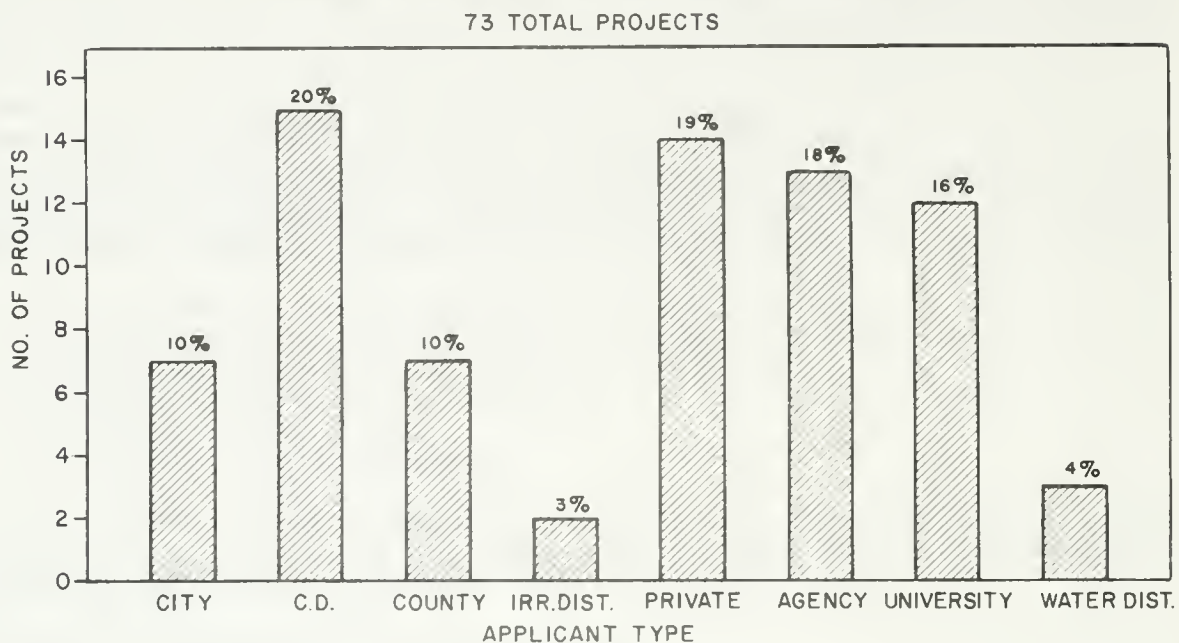
Table 1, which follows the graphs, details the priority ranking and funding recommendations for water projects and activities. Following the table are project summaries describing each application received for grants and loans less than \$200,000.

Although the Department has sufficient loan authority to meet the loan demand, grant requests far exceed grant funds available. Requests for grants totaled almost \$3.4 million. Revenues are projected to be \$1.7 million, which includes the 40 percent Renewable Resource Development Program allocation for water projects as well as the coal tax revenues earmarked for the Water Development Program.*

*This amount is based on budget projections and is subject to change. It should fund approximately the first 23 projects.

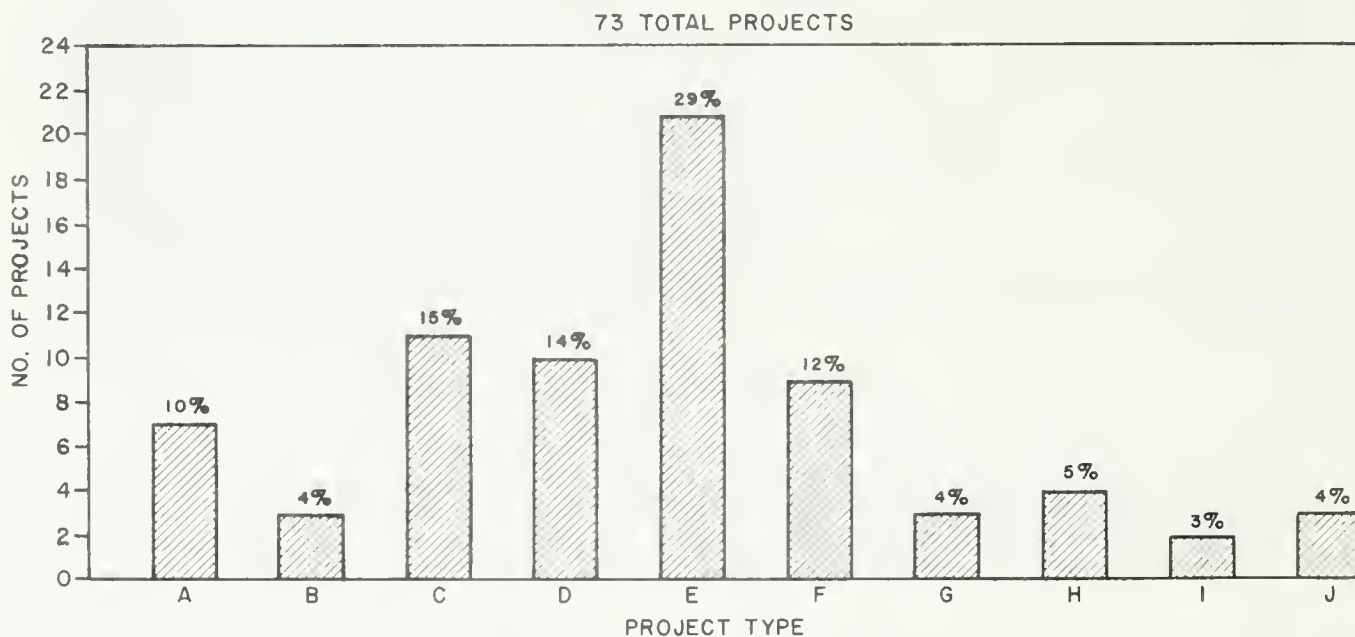
1986 APPLICATIONS
WATER DEVELOPMENT AND RENEWABLE RESOURCE DEVELOPMENT PROGRAMS
WATER PROJECTS

GRAPH 1
BREAKDOWN BY APPLICANT TYPE



C.D. = CONSERVATION DISTRICT AGENCY = STATE AGENCY
 IRR. DIST. = IRRIGATION DISTRICT WATER DIST. = WATER DISTRICT

GRAPH 2
BREAKDOWN BY PROJECT TYPE



A = DAM D = INVESTIGATIONS G = RECLAMATION J = STREAM
 B = FLOOD CONTROL E = IRRIGATION H = RECREATION STABILIZATION
 C = GROUNDWATER F = WATER/SEWER I = RURAL WATER

Note: Percents at tops of columns represent percentage of total applications.

TABLE 1
1986 WATER DEVELOPMENT RANKING AND FUNDING RECOMMENDATIONS

| APPLICANT NAME | PROJECT NAME | PUBLIC BENEFITS | NEED & URGENCY | STATE WIDE APPLICATION | PREVIOUS FUNDING | FAMILY FARM | AG LAND PRODUCTION | RESERVED WATER | WATER STORAGE | AGRICULTURE PREFERENCE | TOTAL | RECOMMENDED FUNDING | CUMULATIVE GRANT TOTAL |
|---|---|-----------------|----------------|------------------------|------------------|-------------|--------------------|----------------|---------------|------------------------|-------|---------------------|------------------------|
| 1 PRIVATE COMPANY LIBRARY | LIMA DAM REHABILITATION STUDY | 23 | 0 | 3 | 5 | 3 | 3 | 5 | 0 | 2 | 5 | \$100,000 | \$100,000 |
| 2 MONTANA BUREAU OF MINES & GEOLOGY | MT WATER RESOURCES DATA MANAGEMENT | 22 | 5 | 5 | 5 | 3 | 3 | 5 | 0 | 0 | 51 | \$97,712 | \$197,712 |
| 3 MEAGHER COUNTY WATER DISTRICT | MOBILITY OF AGRICULTURAL CHEMICALS | 28 | 9 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 51 | \$36,212 | \$136,212 |
| 4 HILL COUNTY | NEWLAN CREEK DAM REHABILITATION STUDY | 23 | 22 | 2 | 5 | 3 | 3 | 5 | 0 | 0 | 50 | \$100,000 | \$196,212 |
| 5 TREASURE COUNTY CONSERVATION DISTRICT | LOWMAN CREEK DAM REHABILITATION STUDY | 21 | 8 | 2 | 5 | 3 | 3 | 5 | 0 | 4 | 1 | \$100,000 | \$196,212 |
| 6 UNIVERSITY OF MONTANA | CONSERVATION PRACTICE LOAN PROGRAM | 21 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 4 | \$100,000 | \$196,212 |
| 7 PRIVATE NON-PROFIT CORPORATION | BERKELEY PIT REINDUSTRIALIZATION STUDY | 27 | 9 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 49 | \$65,760 | \$261,972 |
| 8 MONTANA SALINITY CONTROL ASSOCIATION | BITTERROOT VALLEY GROUNDWATER STUDY | 26 | 8 | 3 | 5 | 2 | 2 | 5 | 0 | 0 | 49 | \$60,000 | \$321,972 |
| 9 PRIVATE COMPANY/INDIVIDUAL | CHEMICAL ASSISTANCE ADVISORISON | 27 | 5 | 3 | 5 | 3 | 3 | 5 | 0 | 0 | 48 | \$60,000 | \$381,972 |
| 10 PRIVATE COMPANY/INDIVIDUAL | SLATEVILLE CANAL Lining | 24 | 7 | 5 | 5 | 3 | 3 | 5 | 0 | 0 | 48 | \$75,000 | \$456,972 |
| 11 PRIVATE COMPANY/INDIVIDUAL | EDGAR CANAL EROSION CONTROL | 21 | 7 | 2 | 5 | 3 | 3 | 5 | 0 | 0 | 48 | \$100,000 | \$556,972 |
| 12 PRIVATE COMPANY/INDIVIDUAL | IRIGATION WATER QUALITY STUDY | 28 | 7 | 3 | 5 | 3 | 3 | 5 | 0 | 0 | 48 | \$97,234 | \$654,206 |
| 13 PRIVATE COMPANY/INDIVIDUAL | REHABILITATION OF EAST SPRING CREEK | 18 | 6 | 2 | 5 | 1 | 1 | 5 | 0 | 0 | 47 | \$6,625 | \$660,831 |
| 14 PRIVATE COMPANY/INDIVIDUAL | IRIGATION REORGANIZATION | 22 | 6 | 4 | 3 | 2 | 2 | 5 | 0 | 0 | 46 | \$1,080,831 | \$1,741,662 |
| 15 PRIVATE COMPANY/INDIVIDUAL | UPPER BLACKFOOT STREAM RECLAMATION | 17 | 10 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 45 | \$100,000 | \$1,841,662 |
| 16 PRIVATE COMPANY/INDIVIDUAL | MELLIE GRANT WINE RECLAMATION | 22 | 10 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 44 | \$64,900 | \$1,906,562 |
| 17 PRIVATE COMPANY/INDIVIDUAL | TURNER CREEK WINE RECLAMATION | 21 | 10 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 44 | \$12,350 | \$1,918,912 |
| 18 PRIVATE COMPANY/INDIVIDUAL | TURNER CREEK WINE RECLAMATION | 19 | 6 | 2 | 5 | 5 | 5 | 5 | 0 | 0 | 44 | \$12,350 | \$1,931,262 |
| 19 PRIVATE COMPANY/INDIVIDUAL | SNOWSHOE CREEK STREAM RECLAMATION | 10 | 10 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 43 | \$100,000 | \$1,971,262 |
| 20 PRIVATE COMPANY/INDIVIDUAL | METRO SEWER SLOUGE APPLICATION | 18 | 10 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 43 | \$100,000 | \$1,971,262 |
| 21 PRIVATE COMPANY/INDIVIDUAL | SHORT CREEK SNOTEL DEVICE | 23 | 5 | 2 | 5 | 2 | 2 | 5 | 0 | 0 | 42 | \$22,567 | \$1,993,829 |
| 22 PRIVATE COMPANY/INDIVIDUAL | AGRICULTURAL RIPARIAN REHABILITATION | 22 | 6 | 4 | 3 | 2 | 2 | 5 | 0 | 0 | 42 | \$100,000 | \$2,093,829 |
| 23 PRIVATE COMPANY/INDIVIDUAL | YELLOWSTONE COUNTY GROUNDWATER STUDY | 19 | 8 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$44,000 | \$2,137,829 |
| 24 PRIVATE COMPANY/INDIVIDUAL | YELLOWSTONE COUNTY GROUNDWATER STUDY | 19 | 8 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$44,000 | \$2,181,829 |
| 25 PRIVATE COMPANY/INDIVIDUAL | YELLOWSTONE COUNTY GROUNDWATER STUDY | 19 | 8 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$44,000 | \$2,225,829 |
| 26 PRIVATE COMPANY/INDIVIDUAL | GRAVITY SPRINKLER IRRIGATION | 18 | 3 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$32,853 | \$2,258,682 |
| 27 PRIVATE COMPANY/INDIVIDUAL | MUSSEL-SHELL WATER AVAILABILITY STUDY | 15 | 7 | 3 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$60,000 | \$2,318,682 |
| 28 PRIVATE COMPANY/INDIVIDUAL | PICK-SLOAN POWER FOR IRRIGATION | 14 | 4 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 42 | \$32,500 | \$2,351,182 |
| 29 PRIVATE COMPANY/INDIVIDUAL | ROBERTS WATER SYSTEM IMPROVEMENTS | 21 | 7 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 41 | \$47,500 | \$2,398,682 |
| 30 PRIVATE COMPANY/INDIVIDUAL | IRIGATION DIVERSION REHABILITATION | 15 | 6 | 1 | 5 | 5 | 5 | 5 | 0 | 0 | 41 | \$142,500 | \$2,541,182 |
| 31 PRIVATE COMPANY/INDIVIDUAL | LITTLE BITTERROOT RECHARGE ENHANCEMENT | 12 | 7 | 2 | 5 | 5 | 5 | 5 | 0 | 0 | 41 | \$86,300 | \$2,627,482 |
| 32 PRIVATE COMPANY/INDIVIDUAL | WHITEFISH BASIN WATER QUALITY | 2 | 2 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 40 | \$35,000 | \$2,662,482 |
| 33 PRIVATE COMPANY/INDIVIDUAL | GRAVITY SPRINKLER IRRIGATION | 15 | 4 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 40 | \$11,150 | \$2,673,632 |
| 34 PRIVATE COMPANY/INDIVIDUAL | WATER STORAGE & DISTRIBUTION IMPROVEMENTS | 20 | 6 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 39 | \$50,000 | \$2,723,632 |
| 35 PRIVATE COMPANY/INDIVIDUAL | SATELLITE GROUNDWATER DATA NETWORK | 17 | 6 | 4 | 3 | 3 | 3 | 5 | 0 | 0 | 39 | \$45,000 | \$2,768,632 |
| 36 PRIVATE COMPANY/INDIVIDUAL | STATE DROUGHT RESPONSE & MITIGATION | 13 | 6 | 5 | 5 | 2 | 2 | 5 | 0 | 0 | 38 | \$30,000 | \$2,798,632 |
| 37 PRIVATE COMPANY/INDIVIDUAL | MASTER WATER PLAN | 13 | 5 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 37 | \$25,000 | \$2,823,632 |
| 38 PRIVATE COMPANY/INDIVIDUAL | SPOTTED EAGLE LAKE ENLARGEMENT | 17 | 5 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 37 | \$62,625 | \$2,886,257 |
| 39 PRIVATE COMPANY/INDIVIDUAL | PEOPLES CREEK REHABILITATION | 11 | 1 | 1 | 5 | 5 | 5 | 5 | 0 | 0 | 37 | \$28,125 | \$2,914,382 |
| 40 PRIVATE COMPANY/INDIVIDUAL | WATER DISTRIBUTION & SUPPLY IMPROVEMENTS | 19 | 6 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 36 | \$50,000 | \$2,964,382 |
| 41 PRIVATE COMPANY/INDIVIDUAL | WILLOW CREEK MEASURING DEVICE | 17 | 4 | 2 | 2 | 5 | 5 | 5 | 0 | 0 | 36 | \$2,074 | \$2,966,456 |
| 42 PRIVATE COMPANY/INDIVIDUAL | ST REGIS PARK IRRIGATION & EXPANSION | 17 | 3 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 36 | \$36,845 | \$2,993,301 |
| 43 PRIVATE COMPANY/INDIVIDUAL | ARSENIC INVESTIGATION IN MADISON RIVER | 13 | 8 | 2 | 5 | 2 | 2 | 5 | 0 | 0 | 36 | \$26,775 | \$3,020,076 |
| 44 PRIVATE COMPANY/INDIVIDUAL | ENERGY EFFICIENT IRRIGATION WORKSHOPS | 13 | 4 | 3 | 5 | 4 | 4 | 5 | 0 | 0 | 36 | \$4,000 | \$3,024,076 |
| 45 PRIVATE COMPANY/INDIVIDUAL | COAL MINERS PARK IRRIGATION & REVEGETATION | 19 | 4 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 35 | \$100,000 | \$3,124,076 |
| 46 PRIVATE COMPANY/INDIVIDUAL | IMPACTS OF SEWAGE ON FLATHEAD LAKE | 19 | 6 | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 35 | \$87,953 | \$3,212,029 |
| 47 PRIVATE COMPANY/INDIVIDUAL | LATERAL REPLACEMENT | 17 | 4 | 1 | 2 | 5 | 5 | 5 | 0 | 0 | 35 | \$40,844 | \$3,252,873 |
| 48 PRIVATE COMPANY/INDIVIDUAL | ASHLEY LAKE DAM REHABILITATION | 16 | 5 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 35 | \$31,500 | \$3,284,373 |
| 49 PRIVATE COMPANY/INDIVIDUAL | SAGE CREEK WATER DISTRICT EXPANSION | 15 | 7 | 0 | 3 | 5 | 5 | 5 | 0 | 0 | 35 | \$39,650 | \$3,324,023 |
| 50 PRIVATE COMPANY/INDIVIDUAL | WATER SYSTEM REHABILITATION | 18 | 5 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 34 | \$25,000 | \$3,349,023 |
| 51 PRIVATE COMPANY/INDIVIDUAL | WATERSPOURING IRRIGATION | 7 | 3 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 33 | \$25,000 | \$3,374,023 |
| 52 PRIVATE COMPANY/INDIVIDUAL | HILLCREST WATER SYSTEM | 15 | 3 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 32 | \$74,934 | \$3,448,957 |
| 53 PRIVATE COMPANY/INDIVIDUAL | HYDROLOGIC CONTROLS ON SELENIUM MOBILITY | 10 | 6 | 3 | 5 | 3 | 3 | 5 | 0 | 0 | 32 | \$90,222 | \$3,539,179 |
| 54 PRIVATE COMPANY/INDIVIDUAL | MCCNEIL SLOUGH RECONSTRUCTION | 13 | 1 | 1 | 5 | 1 | 1 | 5 | 0 | 0 | 31 | \$33,750 | \$3,572,929 |
| 55 PRIVATE COMPANY/INDIVIDUAL | STREAMBANK PRESERVATION PROGRAM | 16 | 3 | 4 | 0 | 2 | 2 | 5 | 0 | 0 | 30 | \$35,000 | \$3,607,929 |
| 56 PRIVATE COMPANY/INDIVIDUAL | WEST VALLEY FLOODING | 13 | 6 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 29 | \$49,000 | \$3,656,929 |
| 57 PRIVATE COMPANY/INDIVIDUAL | GROUNDWATER EXPLORATION OF THE BOZEMAN FAN | 14 | 5 | 2 | 4 | 1 | 1 | 5 | 0 | 0 | 28 | \$44,720 | \$3,701,649 |
| 58 PRIVATE COMPANY/INDIVIDUAL | RED BLUFF RANCH IRRIGATION | 14 | 3 | 1 | 5 | 0 | 0 | 5 | 0 | 0 | 28 | \$32,350 | \$3,733,999 |
| 59 PRIVATE COMPANY/INDIVIDUAL | GREENHOUSE DEVELOPMENT | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 27 | \$50,000 | \$3,783,999 |
| 60 PRIVATE COMPANY/INDIVIDUAL | TURNER PARK IRRIGATION SYSTEM | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 27 | \$50,000 | \$3,833,999 |
| 61 PRIVATE COMPANY/INDIVIDUAL | WETLAND FILTER SYSTEMS FOR MINE TREATMENT | 7 | 4 | 3 | 5 | 0 | 0 | 5 | 0 | 0 | 24 | \$68,110 | \$3,902,109 |
| 62 PRIVATE COMPANY/INDIVIDUAL | BUFFALO RESERVOIR | 5 | 2 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,913,484 |
| 63 PRIVATE COMPANY/INDIVIDUAL | GARTSIDE DAM RECONSTRUCTION | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,924,859 |
| 64 PRIVATE COMPANY/INDIVIDUAL | LITTLE BEAVER CREEK CROSSING | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,936,234 |
| 65 PRIVATE COMPANY/INDIVIDUAL | WATER DEVELOPMENT TEAM CONSTRUCTION | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,947,609 |
| 66 PRIVATE COMPANY/INDIVIDUAL | WATER SYSTEM RECONSTRUCTION | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,958,984 |
| 67 PRIVATE COMPANY/INDIVIDUAL | COMPUTER MODELING OF TAILINGS RECLAMATION | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,970,359 |
| 68 PRIVATE COMPANY/INDIVIDUAL | AMELIORATION OF BRINE & HYDROCARBON LEAKAGE | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,981,734 |
| 69 PRIVATE COMPANY/INDIVIDUAL | SELENIUM IN STOCKWATER | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$3,993,109 |
| 70 PRIVATE COMPANY/INDIVIDUAL | GIBSON FLATS DRAINAGE CHANNEL RENOVATION | 13 | 2 | 2 | 5 | 0 | 0 | 5 | 0 | 0 | 22 | \$11,375 | \$4,004,484 |

** WILL ONLY BE FUNDED IF PROJECTS #1 OR #4 ARE NOT IMPLEMENTED
 ** WILL ONLY BE FUNDED IF PROJECTS #16 OR #17 ARE NOT IMPLEMENTED
 ** RECOMMENDATION NOT YET MADE SEE LEGISLATIVE APPROPRIATION BILL
 ** PROJECTED AND SUBJECT TO CHANGE

FOR CONTINGENCIES TO FUNDING RECOMMENDATIONS, SEE INDIVIDUAL PROJECT SUMMARIES

APPLICANT NAME: Private Company

PROJECT/ACTIVITY NAME: Lima Dam Rehabilitation Project

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Private Company - \$11,000

TOTAL PROJECT COST: \$111,000

PROJECT DESCRIPTION:

Lima dam, located 12 miles east of Lima, Montana in Beaverhead County, is classified as a Category 1 High Hazard Dam and has been declared unsafe in the Corps of Engineers' Phase I Investigation Report. Because of the safety concerns associated with the dam and the need to comply with Montana's dam safety law, the dam owner and operator has retained the services of an engineering firm to perform a dam rehabilitation feasibility study and is seeking funding for this study from the Water Development Program.

Lima dam is 54 feet high with a crest length of 455 feet. It impounds 75,000 acre-feet of water. The water stored in this reservoir serves approximately 30 users and 18,000 acres of irrigated hay land. In addition, the reservoir is an important area for migratory water fowl, and supports the largest population of non-breeding molting Canada geese in the Rocky Mountain region. Failure of this dam will result in much property damage and will significantly impact Clark Canyon dam. Breaching Lima dam will eliminate important water fowl habitat, eliminate flood protection for the basin, reduce farm incomes, and could affect the performance of Clark Canyon dam.

This study will develop alternatives and make recommendations that will result in the most effective solution to the dam safety issue. To do this the engineering firm will perform a hydrologic analysis to define the probable maximum flood, perform a geologic and geotechnical analysis that addresses the stability of the dam and associated structures, perform a hydraulic analysis that will generate preliminary spillway and outlet dimensions, estimate freeboard requirements, and address outlet venting concerns. Preliminary design and financing alternatives complete with cost estimates will be developed. An economic analysis will be performed to help the owners make good management decisions. A final report and preliminary plan for final design and construction of the solution will be prepared.

TECHNICAL ASSESSMENT:

The owners have hired a qualified engineering firm and have presented a reasonable approach to addressing the safety issues associated with Lima dam. The engineering firm hired presented a proposal that addresses the issues in a comprehensive and competent manner.

There are some concerns with the drilling program and the scope of the economic analysis that need to be addressed prior to funding. These matters are presently being reviewed and practical solutions are being determined.

FINANCIAL ASSESSMENT:

The company requests a \$100,000 grant and will contribute \$11,000 to the project through reserve funds and in-kind services. Of the \$111,000 total project cost, \$1,236 is for the review of previous studies and inspections, and \$12,309 is for project management and administration. Geotechnical analysis totals \$23,076, and \$2,629 and \$4,796 are budgeted for hydrologic and hydraulic assessments respectively. A rehabilitation plan will cost \$11,639, \$2,214 is for cost estimates, \$7,548 is for project evaluation and economics analysis, and \$6,400 is for the final report. Drilling costs total \$20,932 and laboratory analysis costs equal \$3,197. Meals and lodging total \$1,280 and \$9,805 is budgeted for other direct costs.

ENVIRONMENTAL ASSESSMENT:

The only adverse impact from the proposed study could be impacts from the draining of the reservoir to investigate the outlet structure as recommended by the U.S. Army Corps of Engineers. To mitigate impacts to the geese, swan, and falcon populations, if draining is necessary, the investigation would be

conducted in late fall and early winter after migration. This precaution will insure that there is no interference with molting, breeding, and migration seasons. In addition, a coffer dam could be constructed to minimize drainage.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of \$100,000 contingent on the formation of an irrigation district or water and sewer district to receive these funds, and on DNRC approval of the final scope of work and budget. In addition, DNRC will require that the company make an effort to involve other affected and interested parties or agencies in the funding of this study.

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APPLICANT NAME: Montana State Library

PROJECT/ACTIVITY NAME: Montana Water Resources Data Management System

AMOUNT REQUESTED: \$97,712 Grant

OTHER FUNDING SOURCES AND AMOUNTS:

Montana State Library (MSL)/Natural Resource Information System (NRIS) (in-kind) - \$49,074

TOTAL PROJECT COST: \$146,794

PROJECT DESCRIPTION:

Coordinated through the Natural Resources Information System, this project will increase the accessibility of water resources data for public and private users in Montana. Many state and federal agencies in Montana are now involved in collecting, recording, and storing water resources data. The result is a vast amount of data maintained in a variety of formats from manual systems to extensive computer files. Each agency stores various types of data necessary for a variety of uses. Thus, the process of searching for and obtaining the specific data by a water user becomes an expensive and time-consuming endeavor. Too often, critical decisions are not based upon available information because of difficulty or expense involved in obtaining the data, or new data may be collected, creating duplication.

The specific objective of this project is to establish a central index of all sources of existing water resources data in Montana. Additionally, a design plan will be developed for a comprehensive water data management system which will provide a central point of access for water data managers and users. This plan will address computer hardware and software needs and linkages with water data management agencies, and will outline and update the maintenance program.

The actual implementation of the water resources data management plan will be a future phase of the project for which additional funding will be sought.

TECHNICAL ASSESSMENT:

The legislature established the Montana Natural Resource Information System to be a "comprehensive program for the acquisition, storage, and retrieval of existing data relating to the natural resources of Montana." A survey conducted by the NRIS indicated that water resources are by far the most difficult natural resource category for which to obtain data.

The need for a central indexing of water resources data management system has been documented. An advisory committee comprised of representatives from nine state and federal agencies has developed the objectives contained in this application. Because of many variables in the collection and storage of water resources data, the committee agreed that each agency should continue to manage and maintain its proprietary records, but that water users should have access to a central index of water resources information.

FINANCIAL ASSESSMENT:

The total costs for this three-year project are \$146,794. The NRIS will provide \$36,554, or 100%, of the funds needed for Fiscal Year (FY) 1987. For FY 1988 and 1989, NRIS will provide \$12,528 and this Water Development grant will fund \$97,712. The total percentage of NRIS funding contributions is 34% and this grant, 66%.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from this project. As users find water resources data more accessible and easy to use, better resource management decisions can be made.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$97,712 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY NAME: Mobility of Agricultural Chemical in Soils and Shallow Groundwater Aquifers

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS:

Montana Bureau of Mines and Geology (MBMG) - \$22,385; United States Geological Survey (USGS) - \$37,200; Montana State University (MSU) - \$20,601

TOTAL PROJECT COST: \$180,186

PROJECT DESCRIPTION:

The use of insecticides and herbicides in controlling common pests and weeds has increased over the past two decades. The sale of synthetic organic pesticides, fungicides, and herbicides more than doubled between 1961 and 1980 and total pesticide sales topped 1.1 billion pounds in 1983. The increase in the number of reported cases of pesticide contaminated groundwater points to a lack of knowledge as to their behavior under natural conditions. The processes and conditions which control the transport of pesticides and herbicides in the semi-arid climate of Montana are not well documented. As such, the magnitude of the potential for groundwater quality degradation is not known.

This project will substantiate whether or not herbicides, insecticides, and fungicides are being leached below the rooting depth of Montana crops and are present in the groundwater resources in key areas of Montana. Because of its increased widespread use and high mobility, the movement of and transport in the water table of chlorosulfuron ("Glean") will specifically be assessed.

Four to six sites will be chosen where sampling will be conducted. The sites will be chosen from among the following areas: the Dagmar Outwash Channel areas (Sheridan County), the Fairfield Bench (Teton County), the Turner/Hogeland Area (Blaine County), the Townsend Valley (Broadwater County), the North Central Montana area (Hill County), the Highwood Bench (Chouteau County), the Huntley area (Yellowstone County), or the Larslan area (Valley County). Pesticide contamination has already been reported in the Fairfield Bench area. The key areas sampled will be representative of the interaction of hydrogeologic conditions, soil conditions, and agricultural management under the semi-arid climate of Montana. The sampled areas can be used as indicators of the potential magnitude of the degradation of groundwater quality by pesticide residues.

The project will be implemented through a combined effort of the MBMG (Hydrology Division), MSU (Soils Department), and the USGS (Water Resources Division).

A detailed summary report of the findings will be prepared by all three cooperators at the end of the project. The findings will be presented to local groups, state and federal organizations such as Conservation Districts, annual Agricultural Planning Conferences, Montana departments of Agriculture,

Health, Natural Resources and Conservation, the Environmental Protection Agency, and other agencies involved in natural resource management.

TECHNICAL ASSESSMENT:

Although the use of long-lived herbicides is increasing rapidly in Montana, almost nothing is known about their fate in the environment. Montanans need to have some information now on whether current agricultural practices may cause major groundwater problems in the future. The proposed combination of field sampling and experimental testing will provide information on both the existence of groundwater contamination and the mechanics of the contamination process. Both types of information will be needed as a basis for future policy decisions on appropriate use of agricultural chemicals. The geographic spread of the proposed sampling network is also appropriate.

The project sponsors are very well-versed in literature related to the contamination of groundwater by agricultural chemicals. As a result, the proposal is focused on addressing those issues important to Montana that have not been fully addressed before.

The project represents an excellent example of interagency coordination. Findings on groundwater contamination will also be useful in light of recent amendments to the federal Safe Drinking Water Act which set limits on permissible concentrations of organic chemical pollutants for public water supply systems.

This project represents the first step towards developing the methods that would allow for mitigation of the pesticide contamination in groundwater, thereby improving water quality and protecting our present water supply. Chlorosulfuron (Glean) presents one of the most serious threats to groundwater quality by agricultural chemicals in Montana. Knowledge of the movement and mobility of this chemical can lead not only to remedial measures, but to the prevention of widespread groundwater quality degradation.

FINANCIAL ASSESSMENT:

Of the \$100,000 grant requested, \$43,200 is for salaries, \$30,000 is for laboratory analysis, and \$10,700 is for equipment, supplies, and publication costs. Drilling costs total \$9,000, \$6,600 is budgeted for travel, and \$1,500 is budgeted for indirect charges to the MBMG.

The project appears to be appropriately budgeted. The state should realize a significant benefit from the \$80,000 in matching funds from USGS, MSU, and MBMG.

The chemical manufacturer of Glean was asked to contribute funding to the project; however, the company was not interested at this time.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from this project. It has the potential to have significantly positive environmental impacts, especially if the findings can be applied to reduce the possibility of future groundwater contamination or to identify and remedy existing contamination.

RECOMMENDATIONS AND CONTINGENCIES:

A grant up to \$98,500 is recommended contingent on DNRC approval of the project scope of work and budget. The first phase of the project must provide screening and demonstration that shows that Glean is the most appropriate chemical to be focusing on at this time. The MBMG should also formally request that the EPA participate in this project by providing additional funding.

The \$98,500 grant figure was reached by subtracting the \$1,500 of indirect costs charged by the MBMG from the \$100,000 grant request.

APPLICANT NAME: Meagher County Newlan Creek Water District

PROJECT/ACTIVITY NAME: Newlan Creek Dam Rehabilitation Study

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$100,000

PROJECT DESCRIPTION:

Newlan Creek dam is located in Meagher County approximately seven miles north of White Sulphur Springs. The dam was planned, designed, and constructed in the 1970s by the Soil Conservation Service (SCS) under their Watershed Protection and Flood Prevention program. The original plan centered around construction of a multipurpose reservoir to provide water for irrigation, to reduce flood damage along Newlan Creek, and to provide water for recreation and fish and wildlife habitat improvement. Much of the water for irrigation was to come from water diverted from the Sheep Creek drainage.

During the course of project design and construction a series of problems developed. Inflation and costs increased, a court determined inadequate water rights for Sheep Creek, and environmental problems with the proposed Sheep Creek diversion resulted in termination of the project before the diversion or the irrigation facilities were constructed. In January 1979, the SCS determined that the feasibility of continuing construction activities with federal or local funds was not justified from an economic standpoint.

The Meagher County Newlan Creek Water District (NCWD) was formed at project inception as the primary local sponsor to qualify for SCS federal program funding. Termination of the project by SCS resulted in a legal action by NCWD against the federal government. The legal settlement provided the NCWD with full ownership of the project and awarded them \$142,857 for operation and maintenance of the dam and reservoir. In addition, the federal government was directed to pay the NCWD bonded indebtedness of approximately \$566,000. Funds provided for project development were a 50 percent cost-share for construction of the dam, a \$460,000 Economic Development Administration grant; and a \$150,000 grant from the Montana Legislature for fish, wildlife, and recreational benefits.

The NCWD now requests a \$100,000 grant to determine the technical, economic, and financial feasibility of rehabilitating the existing dam to conform to the National Dam Safety Program recommended guidelines. All rehabilitation alternatives will be evaluated and their respective costs estimated, with the goal of negotiating with the State of Montana for the potential take-over of the project.

TECHNICAL ASSESSMENT:

The study will assess the needed rehabilitation for Newlan Creek dam. The rehabilitation assessment will respond to the U.S. Army Corps of Engineers' (COE) April 1981 report describing nonconformance with COE dam safety standards. The applicant states that reduction or termination of facility use is an option which will be considered because of the public safety question associated with the dam.

The proposed study is aimed at addressing all dam safety aspects of the project in order to arrive at the best technical, economic, and financial alternative. However, the DNRC Engineering Bureau feels that a more thorough and complete economic, financial, and technical assessment of the dam as proposed in the "Feasibility and System Operation Study" is needed for the state to properly evaluate a potential take-over of the project.

FINANCIAL ASSESSMENT:

The proposed study activity is estimated to cost \$100,000. Engineering will account for \$89,000 of the cost with the remaining going for contract administration. The NCWD has requested grant funds for the entire amount and has indicated that there are no other sources of funds available.

ENVIRONMENTAL ASSESSMENT:

The study activity will make a preliminary environmental assessment that will describe the environmental setting, determine the impacts of the proposed rehabilitation work, and state the recommended mitigation measures. Completion of future improvements to the dam will primarily affect the existing developed project area. Final impacts of such future improvements to the dam will be assessed during the design phase of the project.

There are no long- or short-term negative impacts associated with the study.

RECOMMENDATION AND CONTINGENCIES:

The DNRC recommends a grant up to \$100,000, with the Newlan Creek Water District (NCWD) providing the remaining project funds to complete a study with a scope-of-work at least as extensive as the proposal to conduct a "Feasibility and Systems Operations Study", originally prepared by NCWD's engineer. The total cost of this proposed study was estimated at \$231,000 in June of 1984.

If the NCWD proposes to phase this study, then grant funds of 43% of the total cost for each phase will be provided by DNRC. The NCWD will be required to commit the remaining 57% funding for each phase.

Final DNRC approval of the total project scope of work and budget will be required before any grant funding is released. This analysis should also include recommendations to the NCWD concerning the economic feasibility of breaching the dam compared to rehabilitation alternatives.

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| <u>APPLICANT NAME:</u> | Hill County |
| <u>PROJECT/ACTIVITY NAME:</u> | Lower Beaver Creek Dam Phase II Rehabilitation Study |
| <u>AMOUNT REQUESTED:</u> | \$70,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$70,000 |

PROJECT DESCRIPTION:

The Lower Beaver Creek dam is located on Beaver Creek within Beaver Creek Park approximately 13 miles south of Havre, Montana. The dam was originally planned and constructed under the authority of the Watershed Protection and Flood Prevention Act following Soil Conservation Service (SCS) design criteria, and was completed in 1984. The dam is now owned, operated, and maintained by Hill County. The project was planned as a multi-purpose flood prevention, irrigation, recreation, and fish and wildlife storage facility. A trailer parking area and camping facilities are located on the east shore at an elevation above the top of the dam.

The dam is an earthen embankment 108 feet high and impounds about 6,270 acre-feet of water at the normal pool. Based on the U.S. Army Corps of Engineers' (COE) Recommended National Guidelines for Safety Inspection of Dams the project is large in size and has a high downstream hazard potential. The dam was declared unsafe in the COE Phase I Inspection Report because it cannot safely handle the probable maximum flood (PMF).

Hill County requests a \$70,000 grant to fund an engineering study for the rehabilitation of the Lower Beaver Creek dam. The engineering study will perform feasibility level engineering evaluations of the dam, and provide rehabilitation recommendations which will enable the dam to be in compliance with state dam safety requirements, and will identify potential funding sources to finance the work.

TECHNICAL ASSESSMENT:

A consulting engineer prepared a proposal for Hill County that presents a scope of work for the tasks to be completed for the Phase II Rehabilitation Study. The scope of work includes: stilling basin inspection, subsurface drilling, piezometer installation, stability analyses, flood hydrology/hydraulics studies, hazard assessment, development of a plan of rehabilitation with an associated cost estimate,

identifying possible sources of financial assistance, and preparation of a report. The report will include a summary of previous investigations, a discussion of the geotechnical analysis, details of the flood hydrology and hydraulic analysis, the development of the rehabilitation plan and its costs, and identification of potential funding sources. The report will contain the necessary figures and exhibits to document the study results on a feasibility design level.

The work under the project will be completed according to the following guidelines: COE Recommended National Guidelines for Safety Inspection of Dams, National Weather Service interim or final publications, appropriate U.S. Bureau of Reclamation publications for hydrology/hydraulics and dam design, and the forthcoming Montana Dam Safety Guidelines.

The technical approach that is proposed is comprehensive and should address the appropriate dam safety concerns. The selected engineer has done several dam rehabilitation projects for the state that are similar to this project.

FINANCIAL ASSESSMENT:

Of the \$70,000 grant requested, drilling costs total \$18,813, laboratory testing totals \$2,040, engineering studies and labor total \$43,527, and the balance is for direct costs. Hill County has about \$7,000 in the Beaver Creek Irrigation account to pay for preparation of this application and minor maintenance work. The Beaver Creek Irrigation Project, of which the Lower Beaver Creek dam is a part, does not have repayment capability for this project. The cost for the study appears to be reasonable and realistic.

ENVIRONMENTAL ASSESSMENT:

There will be no long- or short-term negative impacts associated with the study.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends funding only two dam rehabilitation projects per biennium as there are a large number of costly dam rehabilitation projects that must be implemented under the Dam Safety Act, and if several are funded, DNRC may be unable to maintain a variety of project types in this program.

Therefore, a grant of up to \$70,000 is recommended only if one or both of the dam rehabilitation projects that ranked higher than this project (Lima dam and the Newlan Creek dam) do not use their grant funds as recommended. The scope of work and budget for the engineering feasibility study and preliminary design for rehabilitation of the Lower Beaver Creek dam must first be approved by the DNRC before any grant funds are released for this project. The scope of work must also include an economic analysis of the feasibility of rehabilitating the project which is in addition to the work proposed by Hill County.

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APPLICANT NAME: Treasure County Conservation District

PROJECT/ACTIVITY NAME: Conservation Practice Loan Program

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS:

Treasure County CD (in-kind) - \$11,000; Agricultural Stabilization and Conservation Service (ASCS) - \$77,000; Landowners - \$77,000; Landowners Loan Repayment - \$120,000

TOTAL PROJECT COST: \$385,000 (over 5-year period)

PROJECT DESCRIPTION:

Treasure County Conservation District requests a grant of \$100,000 for the district to establish a loan program which will provide low-interest loans to landowners in areas where high priority resource problems have been identified.

Initially, the district will focus the program on converting 11 miles of open irrigation supply ditches to underground pipeline systems. The open ditches will be converted to buried pipeline over a period of five years. These ditches serve 26 landowners.

Maximum loan amounts will be \$10,000 per cooperator at an interest rate of three percent with a five-year payback period. The establishment of a low interest loan program will eliminate the future need for the district to continually seek sources of state grants for conservation projects.

TECHNICAL ASSESSMENT:

The district estimates that the project will eliminate an annual loss of 2,352 acre-feet of irrigation water from supply ditches, for an annual savings of \$28,221. Additional benefits derived from the project will be a reduction of \$15,681 for annual ditch maintenance costs, and an annual savings of \$21,580 for weed control along the open ditches.

The low interest loan program will be administered by conservation district personnel. The loans will be available to landowners in areas where the district has identified high priority conservation needs. The conservation practices will be designed according to Soil Conservation Service (SCS) standards and specifications and will usually be eligible under the ASCS cost-share assistance program.

FINANCIAL ASSESSMENT:

The grant funding for this low interest loan program will eliminate the need for Treasure County CD to continually seek state grants for conservation projects. This low interest revolving loan account may be more effective in getting more conservation practices applied on the ground than will be done with state grants for specific projects.

The loan program will be patterned after a similar loan program established in Rosebud Conservation District.

ENVIRONMENTAL ASSESSMENT:

The replacement of open ditches with buried pipeline will reduce seepage and associated soil salinity problems. Less water will be diverted from the Yellowstone River. Reduced irrigation diversion will help to stabilize flows and benefit fisheries, especially during low flow years.

The environmental impacts of future conservation practices funded under the loan program will have to be assessed on a case-by-case basis but should be environmentally beneficial if designed and implemented in accordance with SCS specifications.

RECOMMENDATION AND CONTINGENCIES:

A grant up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. DNRC must also approve the district's loan program format before funds will be disbursed.

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APPLICANT NAME: Mile High Conservation District

PROJECT/ACTIVITY NAME: Berkeley Pit Reindustrialization and Mineral Recovery

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Headwaters Resource Conservation and Development (RC&D) - \$1,000

TOTAL PROJECT COST: \$101,000

PROJECT DESCRIPTION:

The Berkeley Pit, located in Butte, was originally the largest open pit copper mine in the United States. Since 1983 when the mine operations ceased, the pit has been filling with water at the estimated rate of 7,000 to 10,000 gallons per minute. Sometime within the next 20 years, the pit will reach capacity, and alternatives for stabilizing the water flow must be in place. The water within the pit contains high concentrations of various metals such as aluminum, cadmium, copper, arsenic, nickel,

and zinc. If the water is to be discharged to a receiving water body, it must first be cleaned. Data on the pit water quality is lacking.

The purpose of this project is to obtain funding to begin an overall investigation on developing a water cleaning technology for application to mine wastewater situations. The funds requested will provide the seed money to begin the investigative process required for this complex project.

The project as envisioned has three phases. Phase I (which this grant will cover) is for the investigative process needed to fully define the problem and alternative ways of solving it. Phase II will include synthesizing the data into a computer model used to determine the effectiveness and cost of various cleanup technologies. Phase III will be the actual development of an on-site pilot water cleaning plant. Funds for Phase II and III are not requested at this time. It is anticipated that a grant application for Phase II activities will be submitted to the Resource Indemnity Trust grant program and a grant application for Phase III activities will be made to the Environmental Protection Agency.

Phase I activities include: convening a meeting of all the project participants to refine the experimental design, budget, and timeline, compiling existing water quality data, determining the physical and biochemical parameters of the Berkeley Pit water, developing and verifying future projections on water quality and quantities, conducting a literature review of innovative mine wastewater cleaning technologies, investigating alternatives for water cleanup, and convening a meeting with a wide spectrum of knowledgeable scientists. The scientists will review the data and information compiled, determine the appropriateness of developing a computer model, develop input parameters for the model, and determine the next steps for model development.

The Mile High Conservation District will work cooperatively with the Headwaters Research Institute (HRI), National Center for Appropriate Technology (NCAT) and the Headwaters Resource Conservation and Development (RC&D) office in administrating and implementing the project. Funds received will be administered through the Board of Directors of the HRI. The conservation district will be requested to have a member on this Board. This governing body will contract with NCAT for overall coordination of project activities. Research activities will be carried out by parties yet to be identified.

TECHNICAL ASSESSMENT:

The reclamation of the water in the Berkeley Pit is an extremely complex problem which will be addressed in Phase II of this project incorporating the latest techniques developed by scientists from across the country. The ultimate goal is to develop techniques which will treat the waters in an economically viable means for metal recovery. It is not possible at this time to develop any assessment for the project feasibility, but state and nationally-known experts will be involved.

FINANCIAL ASSESSMENT:

The \$100,000 grant request in this application is for Phase I (literature search and inventory stage) of the overall project. Headwaters RC&D will donate \$1,000 of in-kind services toward this project. Because the specifics of data gathering and literature search have not yet been fully developed, it is difficult to determine if the requested grant amount is reasonable.

ENVIRONMENTAL ASSESSMENT:

No impacts will occur from the implementation of this project.

RECOMMENDATION AND CONTINGENCIES:

DNRC is not making a recommendation for funding at this time. It is recognized that this application has merit and perhaps should receive funding. However, the final funding recommendation may be dependent upon the availability of funding under the EPA Superfund program. DNRC will make its funding recommendation for this application in the appropriations bill submitted to the legislature.

APPLICANT NAME: University of Montana

PROJECT/ACTIVITY NAME: Bitterroot Valley Groundwater Study

AMOUNT REQUESTED: \$75,048 Grant

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$75,048

PROJECT DESCRIPTION:

In the Bitterroot Valley surface streams have run dry in August in six out of thirteen years. Groundwater demand has increased one hundredfold in the last twenty-five years, while aquifer recharge has decreased by about 30 percent. As a result, wells in the eastern and western margins of valley aquifers are pumped dry in mid- to late winter. Changing socio-economic uses of land and water indicate a worsening of the problem within the next decade.

For the past ten years, using \$20,000 of personal funds and a \$75,000 National Science Foundation grant, a University of Montana Geology professor has collected groundwater data for use in determining the water budgets in the Bitterroot aquifers. The University of Montana has proposed this project for the purpose of completing those field studies, updating, compiling, and computerizing the expanding data base, drafting aquifer maps and overlays, producing a final report on the groundwater resource, and proposing management and mitigation alternatives for county, state, and federal use.

TECHNICAL ASSESSMENT:

It has been well documented that a rapidly expanding rural and semi-rural population has placed increasing pressure on what are generally marginally productive aquifers along the periphery of the Bitterroot Valley. The only active Controlled Groundwater District in the state covers portions of a low-productivity aquifer on the western margin of the valley.

DNRC's Water Management Bureau's analysis of groundwater rights questions often suffer from a lack of long-term data of regional scope. They cannot generate this type of data and so are supportive of this proposal along with the Water Rights Bureau.

The proposal needs more technical detail for a complete assessment to be conducted. However, the concepts proposed are well thought out and supported by a wide variety of local and state entities.

Reviewers have indicated that the number of wells monitored might have to be reduced somewhat; however, this could be done without seriously compromising the quality of the study.

The data presentation format described should be very useful in county septic system permitting and in land use planning. Of the various types of data collected, several would be of most direct use to DNRC. These include stratigraphic data, well yields, ditch and stream-channel leakage, and magnitude of seasonal fluctuations. Production of these most immediately useful overlays should be a high priority.

FINANCIAL ASSESSMENT:

Of the \$75,048 grant requested, \$30,960 is for salaries and benefits of a graduate research assistant and typist. Drafting and map plots will cost \$16,000 and report preparation and supplies will total \$9,200. Travel and per diem costs will be \$9,600 and indirect costs to the University of Montana will total \$9,288.

Because the principal investigator is not requesting compensation for himself, owns his own computer equipment, and lives in the area of the study, the proposed budget is quite small for the amount of work proposed.

The principal investigator has collected a great deal of valuable water resource information, so far at no cost to state or local government. The funding requested would allow him to put this data into a readily accessible form and allow residents and resource managers to benefit from the several years of work and from past research funding.

While there is local government support for this project, Ravalli County is not contributing funds toward its implementation.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will occur from implementing this project. If the project results in better land-use planning that reduces or mitigates the groundwater mining in the Bitterroot Valley, the long-term results will be very positive.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$65,760 is recommended contingent on DNRC approval of the project scope of work and budget.

The \$65,760 figure was reached by subtracting the \$9,288 of indirect costs charged by the University of Montana from the \$75,048 grant request.

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| <u>APPLICANT NAME:</u> | Private Non-Profit Corporation |
| <u>PROJECT/ACTIVITY NAME:</u> | Technical Assistance Advisor |
| <u>AMOUNT REQUESTED:</u> | \$60,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | National Rural Water Association, \$186,000 |
| <u>TOTAL PROJECT COST:</u> | \$246,000 |

PROJECT DESCRIPTION:

The applicant is a private non-profit corporation that provides technical assistance and training to rural water system owners and operators through on-site visits and workshops. Assistance is given in the area of proper maintenance and repair of water systems, and training of plant operators and administration personnel about conservation techniques and procedures. This grant would add another full-time employee to the two-member staff to allow the assistance program to cover a larger area of the state, and would pay for an additional six training and conservation workshops.

TECHNICAL ASSESSMENT:

With the decrease in availability of funds, an increase in contamination potentials, and a rising cost in production and equipment, the demands on the staff have been such that some systems have had to be turned down for assistance.

Technical assistance to systems is presently being offered through at least 700 visits to systems annually and at least twelve regularly scheduled workshops that provide training in operational procedures as well as water conservation. This project would add at least 300 visits to systems and at least three additional training and conservation workshops annually to the present program. Because most of the rural communities in the state cannot afford to pay for highly trained operators to run their water systems, this corporation provides a needed and cost-effective alternative.

FINANCIAL ASSESSMENT:

Of the \$60,000 grant, \$30,000 will be for the technical advisors' salary, \$18,000 for travel, \$2,200 for training material and equipment rental, and the remaining \$9,800 for associated administrative costs, fringe benefits, taxes, and bookkeeping salary.

Funds that are received from the National Rural Water Association are federal money. Federal support for this program has been strong and funds are not currently threatened.

The corporation received a \$21,000 Water Development grant in 1985 to fund a part-time technical advisor, and \$825 to purchase leak detector equipment.

ENVIRONMENTAL ASSESSMENT:

No adverse impacts are expected to result from this project.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$60,000 is recommended contingent on DNRC approval of the project scope of work and budget. The National Rural Water Association funding contribution must be documented to insure that Water Development funds are providing no more than 25% of the total cost.

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APPLICANT NAME: Montana Salinity Control Association

PROJECT/ACTIVITY NAME: State Salinity Control Expansion

AMOUNT REQUESTED: 100,000 grant

OTHER FUNDING SOURCES AND AMOUNTS: Montana Salinity Control Association (MSCA) - \$25,000

TOTAL PROJECT COST: \$125,000

PROJECT DESCRIPTION:

The Montana Salinity Control Association was formed in 1985 to combine three organizations involved in saline seep reclamation and prevention. The areas involved encompass thirty-three counties. MSCA operates a program of technical field assistance designed to correct saline seep problems and reclaim land on a farm-by-farm basis. The technical field team and equipment are stationed in Conrad, and were centrally located and adequate to serve the ten-county Triangle Conservation District, founders of the saline seep reclamation program. However, the expansion from a ten to a thirty-three county area has brought increased applications for assistance and made it necessary for the staff to travel longer distances to reclamation projects. The resources available to meet the increased workload demands are limited. A backlog of 45 applications are on file requiring a one-and-one-half to two-year wait for service.

Grant funds will be used to:

1. Purchase an additional Mobile B-31 drill rig or upgrade the existing drill rig.
2. Purchase equipment to streamline field work and plan development.
3. Increase the number of reclamation plans developed to 30 per year and reduce the backlog of applications on file.
4. Expand the continuing education program through follow-up contact with existing cooperators and technical presentations, in order to increase reclamation success.

TECHNICAL ASSESSMENT:

Saline seep is the result of widely-accepted farming practices developed over the last 50 years. The alternate crop-fallow method contributes to an accumulation of excess soil moisture that eventually becomes salinized and results in saline seep.

The solution to saline seep is to use the available moisture as it occurs, through vegetative growth. Flexible intensive cropping practices and the use of permanent, deep-rooted vegetation such as alfalfa are effective in the control and reclamation of saline seep areas. This method replaces the drainage approach, which simply transferred the problem of contaminated water elsewhere.

The MSCA technical field team has developed a proven technique to work on a farm-by-farm basis to achieve saline seep prevention and reclamation using state-of-the-art methods of recharge area identification, intensive cropping, and reclamation techniques.

In the MSCA program, areas of moisture recharge--the areas contributing to the seep formation--are identified with the use of a drill rig. The landowner is offered recommendations concerning soils, the extent of recharge area, federal farm program requirements, marketing, weed problems, etc., which allow a site-specific method of saline seep control.

Assistance for saline seep control can be obtained by individuals or groups applying to their conservation districts. The applications are forwarded to the field team in Conrad. The landowners are asked to pay for a portion (1/3) of the technical assistance, but cost-sharing is available from the Agricultural Stabilization and Conservation Service (ASCS) for both plan development and implementation.

MSCA works cooperatively with Montana Agricultural Experiment stations and Montana Cooperative Extension Service to bring the latest research results to producers. MSCA has been recognized for its efforts in promoting intensive cropping systems and conservation tillage in a manner that is both economically feasible and oriented to resource management.

FINANCIAL ASSESSMENT:

A request for assistance for this project was submitted to the 1985 Legislature to supply funds for equipment, additional staff, and operating expenses for the expanded salinity control program. The assistance was allocated through a \$150,000 grant from the Resource Indemnity Trust Fund (RITF). However, because the available revenue from RITF is uncertain, the applicant has requested a grant from the Water Development Program.

Of the \$125,000 total project cost, \$48,000 is for salaries, \$50,000 for drill rig equipment, \$22,000 for operating costs, and \$5,000 for administration. Landowner fees for technical assistance are expected to contribute \$25,000 to the project. Since 1979, \$716,000 in Water Development and Renewable Resource Development grant funds have been awarded for the continued operation of this salinity control program.

ENVIRONMENTAL ASSESSMENT:

No adverse impacts will result from the implementation of this project.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget.

Grant funds shall not be awarded if Resource Indemnity Trust Fund grant funds approved in 1985 are available.

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APPLICANT NAME: Montana State University/Agricultural Engineering Department

PROJECT/ACTIVITY NAME: Plastic Irrigation Canal Lining

AMOUNT REQUESTED: \$98,073 Grant

OTHER FUNDING SOURCES
AND AMOUNTS:

None

TOTAL PROJECT COST: \$416,073

PROJECT DESCRIPTION:

Montana State University proposes to become involved with a project designed to develop and economically produce plastic canal liners by evaluating the duration and cost of the various plastic formulations. MSU would be involved as an independent party strictly to evaluate the installed liners.

A private plastics development company from Billings has devised an innovative method to apply and install plastic irrigation canal liners by using a mobile self-powered machine which can mix various plastic formulations in the field and apply the liquid plastic. Once applied to the irrigation ditch, the plastic "sets up" to a desired thickness and hardness and will conform to the shape of the ditch.

It is anticipated that formulations of the plastic material can be adjusted to adopt to the many varying field conditions, including size and use of the ditch, temperature and wind conditions during application, vegetative growth along ditch banks, soil texture, chemical properties, and the trampling of livestock. The various plastic mixes chosen will be selected on the basis of laboratory tests made prior to field placement.

The linings will be installed at test sites and canal sections provided by the Huntley Project Irrigation District. The district has agreed to fully support the project by allowing the use of canals and laterals as test sites. The district will do preparation work as necessary for installation of materials at the test sites.

The funds requested for this project will be devoted to evaluating the performance of the plastic liners under actual field conditions. The evaluation parameters will include factors which affect or may affect the long-term viability of the lining material.

TECHNICAL ASSESSMENT:

The loss of irrigation water through seepage, the cost of annual ditch maintenance, and the control of noxious weeds along irrigation ditches represent significant problems and costs associated with many irrigation systems in Montana. Plastic membrane lining of ditches is not new; however, problems such as high cost, fragility, short life, and installation difficulties have resulted in limited use of plastic membranes.

This particular plastic company has developed the technology to be able to adjust the plastic chemical components on-site to meet the various demands of the ditch liner as required in the field. If the results of the evaluation of the material are favorable and the cost proves to be reasonable, implications to the irrigated agriculture industry could be quite significant.

The involvement of MSU as an independent party will lend credence to the product evaluation, possibly leading to quicker acceptance by irrigation water users, and will provide necessary information to the Soil Conservation Service (SCS) and Agricultural Stabilization and Conservation Service (ASCS) for possible inclusion for approved cost-share practices.

The Soil Conservation Service strongly recommends approval of this application.

FINANCIAL ASSESSMENT:

The grant funds requested in this application amounts to 24% of the total costs. All grant funds will be used by MSU, with \$65,944 for personnel costs, \$9,000 for office equipment and travel, \$23,129 for sampling and monitoring equipment, and \$15,129 in indirect costs to MSU.

The liner, if durable and cost-effective enough to actually be installed in significant amounts, could provide a new business for Montana having regional and national implications.

ENVIRONMENTAL ASSESSMENT:

Little or no adverse environmental impacts could be expected during the evaluation period. However, if the liner is widely used substantial advances in soil and water conservation could be realized.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$75,000 for this project, which reflects an elimination of \$15,129 for indirect costs charged by MSU. DNRC must approve the scope of work and budget. In the event that the canal liner proves to be financially successful to the private company, DNRC will require repayment of the grant funds from the company.

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| <u>APPLICANT NAME:</u> | Private Company |
| <u>PROJECT/ACTIVITY NAME:</u> | Edgar Canal Erosion Control Project |
| <u>AMOUNT REQUESTED:</u> | \$12,500 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Private Company - \$12,500; Agricultural Stabilization and Conservation Service (ASCS) - \$25,000 |
| <u>TOTAL PROJECT COST:</u> | \$50,000 |

PROJECT DESCRIPTION:

The purpose of this project is to control accelerated bank erosion caused by artesian water pressure along a section of the Clarks Fork of the Yellowstone River in Carbon County. The Soil Conservation Service (SCS) estimates that at present approximately 5,625 tons of sediment annually are picked up by the river at this particular point. If the erosion is not checked, the Edgar Irrigation Canal and a

county road will be destroyed. Approximately 1,070 irrigated acres are served by the canal below the point of erosion.

The plan for controlling the accelerated bank erosion includes riprapping, back sloping, terracing and revegetating the high steep cut bank, and draining and diverting the artesian flow water which is causing the slumping of the saturated bank into the river.

TECHNICAL ASSESSMENT:

This area of accelerated bank erosion was first investigated by the SCS in 1976. It was thought that irrigation and seepage from the canal were the main contributing factors to the bank erosion. Irrigation of the field above the river ceased and that portion of the canal was lined with bentonite; however, no decrease occurred in the rate of bank erosion. The SCS then conducted a hydrological study in 1985 and discovered that the cause of the bank sloughage was a buildup of artesian water saturating the bank, and was not caused from seepage from the canal or from irrigation above the river.

The SCS developed the remedial plan. A six-inch drain will be placed ten feet deep and outletted to divert the artesian water to dry out the bank area. The bank will be terraced and seeded to a sod-forming grass to stabilize the cut area. A 20-foot berm will be constructed at the bottom of the slope and seeded to grass and willows. Rock riprap will be placed at the river to keep the bank stabilized.

FINANCIAL ASSESSMENT:

The Soil Conservation Service prepared the complete erosion control plan and estimated the cost to be \$50,000. Drainage of the artesian water is estimated to cost \$4,567.50. Bank shaping will total \$8,000, and riprapping will cost approximately \$32,600. Revegetating the disturbed areas is estimated to cost \$500.

The company will assess the water users for their portion of the project cost. The company has 1,200 shares which are presently assessed at \$10 per share. The assessment will be approximately \$10.42 per share after the project is implemented.

ENVIRONMENTAL ASSESSMENT:

Environmental effects should be positive since an estimated 5,625 tons of sediment per year will be prevented from entering the Clarks Fork of the Yellowstone River.

RECOMMENDATION AND CONTINGENCIES:

A grant of 20% of the total project cost up to a maximum of \$10,000 is recommended contingent on DNRC approval of the project scope of work budget. Since this project will protect a county road, DNRC recommends that the company seeks a contribution to the project from Carbon County either through in-kind contribution of equipment or funds.

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APPLICANT NAME: Powder River Conservation District

PROJECT/ACTIVITY NAME: Powder River Irrigation Water Quality Study

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Powder River Conservation District (PRCD) and Soil Conservation Service (SCS) In-kind Services - \$3,000; DNRC Conservation Districts Division 223 Grant for Phase II (already completed) - \$7,500

TOTAL PROJECT COST: \$110,500

PROJECT DESCRIPTION:

The Powder River Conservation District proposes to conduct a study to estimate the effects a decrease in water quality or water availability will have on crop yields in the Powder River Basin. Water quality

and quantity have become issues to Powder River area irrigators as a result of saline water discharges from Wyoming's Salt Creek oilfield and proposed new water storage and irrigation projects in Wyoming. The district has a responsibility to protect the existing quality of the 13,680 acre-feet of reserved water granted to them in 1978.

The purpose of this study is to provide baseline data regarding the quality of irrigation water in the Powder River through water sample analysis, and to document how an increase in total dissolved solids will affect crop yields.

Documentation resulting from this study may provide a basis if Montana decides to litigate water quality issues under the Yellowstone Compact. The study may also provide the impetus for intervention by the Environmental Protection Agency (EPA) to help resolve water quality issues existing in the Powder River.

TECHNICAL ASSESSMENT:

The study has been divided into three phases:

Phase II, a literature search and analysis of the existing data, has been accomplished with the assistance of a \$7,500 House Bill 223 grant from DNRC.

Phase I, water quality monitoring, will include the collection and analysis of 100 water samples during the irrigation season for two consecutive years. The cost is approximately \$100 per sample.

Phase III is the collection and analysis of crop yield data and analysis of impact. Experimental plots will be selected which represent typical soils, crops, irrigation schedules, and harvest times in the Powder River Basin. The plots will be treated with irrigation water of varying total dissolved solids and sodium absorption ratios levels. Crop production will then be measured for total biomass and nutrient content.

The study duration is proposed to be two years; however, two field seasons may not be sufficient time to acquire any meaningful data. Also, the application was not clear as to how differing levels of water quality are to be obtained for evaluation under Phase III.

FINANCIAL ASSESSMENT:

The total cost for the study is estimated at \$110,500. Phase II of the study was completed for a cost of \$7,500. Salaries account for \$49,000; administrative costs total \$10,000, and equipment and lab services amount to \$36,000. The grant request of \$100,000 will be used only for Phase I and Phase III of the study.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts are anticipated as a result of this study. Long-term effects may be beneficial if study results are properly implemented and applied.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of \$100,000 with contingencies that a technical advisory committee be formed, the scope of work and budget be approved by DNRC, and that DNRC can advise on contractor selection. Should this project receive Resource Indemnity Trust funding, it will not receive this Water Development grant.

APPLICANT NAME: Flathead Conservation District

PROJECT/ACTIVITY NAME: Rehabilitation of East Spring Creek

AMOUNT REQUESTED: \$97,234 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Bonneville Power Administration (BPA) Fish Mitigation Funds - \$219,192

TOTAL PROJECT COST: \$316,728

PROJECT DESCRIPTION:

East Spring Creek, a formerly productive spring creek in Flathead County, has been suffering continuing degradation of its water quality and fishery due to improper land use, heavy siltation, and partial urbanization along its banks where it flows through the community of Evergreen. The Flathead Conservation District funded a study to assess the restoration needs of East Spring Creek.

Included among the specific objectives in the restoration of East Spring Creek are the enhancement of the resident brook trout fishery and the development of needed spawning habitat for kokanee salmon.

TECHNICAL ASSESSMENT:

The rehabilitation plan for East Spring Creek, prepared with funding provided by the Flathead Conservation District, made the following recommendations for improving the fishery:

1. Augmentating the base flow by supplementing water from the Flathead River.
2. Removing sediments in the creek bed by dredging.
3. Re-establishing riparian vegetation.
4. Fencing critical stretches of streambank.
5. Providing fishways around obstructions in the creek.

The study appears to have thoroughly evaluated alternatives and recommends treatment which can, if successfully implemented, restore East Spring Creek to its formerly productive state.

The Department of Fish, Wildlife and Parks, as well as other local conservation groups, are supportive of the plan.

FINANCIAL ASSESSMENT:

Flathead Conservation District has expended \$5,000 of its fund for the rehabilitation plan for East Spring Creek. The district also has budgeted an additional \$5,000 in 1986-1987 for the activities of a local steering committee and for preliminary investigations into easement requirements.

The Bonneville Power Administration funds are fish habitat mitigation funds mandated by the Northwest Power Planning Act. This money will be made available (if secured) in 1988 and will likely be contingent upon funds secured for the rehabilitation of channel and riparian communities.

The rehabilitation project can be separated into two activities: design and construction of the diversionary structures in Flathead River (for which BPA money is sought) and rehabilitation of East Spring Creek. Grant funds will be used for fencing, dredging, fishway structures, and revegetation. Other state agency programs and conservation organizations will be contacted for additional support.

ENVIRONMENTAL ASSESSMENT:

The proposed rehabilitation activities will be environmentally beneficial in the long term. Short-term adverse effects will result during dredging and removal of debris. Some disturbance of sediments will also occur during construction and placement of fishways.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$97,234 contingent upon the success of the district in securing the BPA fish mitigation funds and also upon the district being able to obtain a water permit for the diversion of water from the Flathead River. DNRC must also approve the project scope of work and budget.

APPLICANT NAME: Rosebud Conservation District

PROJECT/ACTIVITY NAME: Irrigation Reorganization

AMOUNT REQUESTED: \$17,345 Grant

OTHER FUNDING SOURCES

AND AMOUNTS: Agricultural Stabilization and Conservation Services (ASCS) - \$3,500;
Private - \$8,155

TOTAL PROJECT COST: \$26,500

PROJECT DESCRIPTION:

This project, located approximately seven miles west of Forsyth, represents the final phase of a larger irrigation system reorganization project. The project area includes 235 acres of irrigated land, and 35 acres which will be put under irrigation. The overall reorganization includes the replacement of 5.3 miles of severely seeping delivery ditches with 1.7 miles of buried pipelines, the installation of a pump sump and two turbine pumps, and land leveling on 250 acres. The entire 270 acres will be irrigated with gated pipe. This final phase of the project will involve 1,600 feet of irrigation pipe, the installation of one pump, and electrical panel and land leveling on 35 acres.

The project started in the fall of 1985; the last phase will be completed in the spring of 1988.

TECHNICAL ASSESSMENT:

The entire project has been designed by the Soil Conservation Service (SCS) and the completed portions were conducted in accordance with SCS standards and specifications.

It is estimated that the overall irrigation efficiency will increase from 40% to 65% after the entire project has been completed. This means a net decrease of 235 acre-feet in water diverted. The actual delivery system loss of water will be eliminated. Production is expected to increase from approximately two tons of alfalfa per acre to five tons per acre on the 270-acre project.

FINANCIAL ASSESSMENT:

Cost estimates for the land leveling and pipeline installation were obtained from the local ASCS and SCS offices, based on annually updated average costs. Pump costs and installation charges are based on bids received from private firms.

The total project cost is estimated at \$116,865, of which the requested grant funds will contribute approximately 15%. The requested grant would make up about 65% of the final phase cost.

The gross revenue increase from increased alfalfa production is approximately \$150/acre, or \$40,500 for the 270 acres in the project. This assumes that alfalfa will be grown on all acres, and that price equals \$50/ton for alfalfa hay.

ENVIRONMENTAL ASSESSMENT:

Overall environmental effects will be beneficial, because less water will be required for diversion. Seepage from delivery systems will be eliminated, resulting in reduced land degradation from salt accumulation and soil saturation.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the cost of the final phase up to a maximum of \$6,625 is recommended contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Montana Department of State Lands

PROJECT/ACTIVITY NAME: Upper Blackfoot River Streambank Reclamation

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Department of State Lands (DSL) - Abandoned Mine Reclamation - \$7,800

TOTAL PROJECT COST: \$107,800

PROJECT DESCRIPTION:

The DSL-Abandoned Mine Reclamation Bureau proposes to reclaim streambanks, floodplains, and disturbed areas in the Blackfoot River watershed which have been damaged from past hard-rock mining activities.

The Mike Horse and Carbonate mines are located in the uppermost drainage of the Blackfoot River approximately 15 miles east of Lincoln, Montana. Each of the mines consists of adits, tailings dump areas, and associated disturbed areas. Runoff from streams is eroding the tailings and other disturbed areas into the Blackfoot River. Surface and groundwaters flowing through the tailings are leaching heavy metals into the creek system. The leachate from the tailings has killed all fish and bottom life in the streams.

The proposed reclamation plan will restore the area to its natural state and eliminate visual and biological pollution. Mine adits will be collapsed, sealed, and regraded, and the tailings will be moved away from surface and groundwater sources to prevent leaching. Disturbed areas will be recontoured and revegetated.

The mines are owned by the American Smelting and Refining Company (ASARCO); however, ASARCO is not contributing to the cost of the reclamation.

TECHNICAL ASSESSMENT:

The reclamation techniques to be used are not innovative but have been used successfully by the DSL at other sites in Montana.

Reviewers expressed concern that impacts to groundwater are not addressed in the off stream locations where the tailings are dewatered and piled after being removed from the streams. Nor does the applicant address the need for treatment of the drain water from the Mike Horse adit, or the significance of the cultural resources of the Carbonate Mine. No groundwater monitoring is included in the plan, nor monitoring to assess pre- and post-project changes in stream water quality, fish populations, or the success of the revegetation.

State laws will require adequate bonding for further reclamation under an operating permit if the site is re-mined in the future.

FINANCIAL ASSESSMENT:

Of the \$107,800 total project cost, \$19,400 is for salaries of the contract administrator, engineer, inspector, technician, and typist. Travel and inspection costs are \$3,700 and printing costs total \$500. Construction labor and materials total \$71,000 and inflation and contingency, \$13,200. Cost estimates were calculated based on costs of similar reclamation projects. No economic cost/benefit assessment was submitted by the applicant. DSL-Abandoned Mine Land Reclamation funds were used to develop the reclamation plan.

ENVIRONMENTAL ASSESSMENT:

Short-term environmental impacts include the possibility of increased sediment production from instream construction activities, short-term erosion from the new spoils piles until the vegetation is reestablished, as well as some dust, noise, and possible loss of recreational opportunities at the nearby Aspen Grove recreational site and degraded aesthetics during the construction period.

Long-term impacts should be very positive if the reclamation reduces or eliminates the heavy metal contamination of the Blackfoot River.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on the following:

1. The landowner (ASARCO) must be asked to contribute matching funds toward implementation of the project. The grant will be reduced by the amount of match funds ASARCO contributes.
2. DSL must develop a groundwater monitoring plan for the project and conduct monitoring to determine impacts to groundwater from the project implementation. Approximately seven thousand dollars (\$7,000) must be budgeted for the monitoring program.
3. DNRC must approve the project scope of work and budget and the groundwater monitoring plan.
4. If Resource Indemnity Trust grant funds are approved and available for this project, Water Development grant funds shall not be used.

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APPLICANT NAME: Montana Department of State Lands

PROJECT/ACTIVITY NAME: Nellie Grant Mine Reclamation

AMOUNT REQUESTED: \$77,900 Grant

OTHER FUNDING SOURCES

AND AMOUNTS: None

TOTAL PROJECT COST: \$77,900

PROJECT DESCRIPTION:

The Montana Department of State Lands (DSL)-Abandoned Mine Reclamation Bureau proposes to reclaim streambanks, floodplains, and disturbed areas in the upper Lump Gulch watershed south of Helena which have been damaged from past hard-rock mining activities at the Nellie Grant Mine. The project site consists of a mine entrance, a tailings dump area, leach piles, and several buildings. The tailings and leach material are being eroded downhill from the mine into the Lump Gulch drainage. The surface and groundwater flowing through the tailings are leaching heavy metals out of the tailings into Lump Gulch.

The proposed reclamation plan will restore the area to its natural state and eliminate visual and biological pollution. The mine entrance will be backfilled and sealed. The tailings and leach piles will be regraded and sloped to prevent further erosion of the material. Tailings material will be removed from the channel of Lump Gulch, and disturbed areas will be topsoiled and revegetated.

TECHNICAL ASSESSMENT:

The reclamation techniques to be used are not innovative but have been used successfully by the DSL at other sites in Montana.

Reviewers expressed concern that impacts to groundwater are not addressed in the off stream locations where the tailings are piled after being removed from the streams. No groundwater monitoring is included in the plan, nor monitoring to assess pre- and post-project changes in stream water quality, fish populations, or the success of the revegetation. If successful, this project would result in improvements to the water quality of Prickly Pear Creek and would therefore complement downstream reclamation work being done with 1985 Water Development grant funds.

State laws will require adequate bonding for further reclamation under an operating permit if the site is re-mined in the future.

FINANCIAL ASSESSMENT:

Of the \$77,900 grant requested, \$18,500 is for salaries of the engineer, inspector, technician, and typist. Travel and per diem costs are \$4,700 and printing costs total \$500. Construction labor and materials total \$45,300 and inflation and contingency, \$8,900. Cost estimates were calculated based on

costs of similar reclamation projects. No economic cost/benefit assessment was submitted by the applicant. DSL-Abandoned Mine Land Reclamation funds were used to develop the reclamation plan.

ENVIRONMENTAL ASSESSMENT:

Short-term environmental impacts include the possibility of increased sediment production from instream construction activities, short-term erosion from the new spoils piles until the vegetation is reestablished, as well as some dust, noise, and degraded aesthetics during the construction period.

Long-term impacts should be positive if the reclamation reduces or eliminates the sediment contribution and heavy metal contamination of Lump Gulch and Prickly Pear Creek and improves the fishery resource.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$84,900 is recommended contingent on the following:

1. DSL must develop a groundwater monitoring plan for the project and conduct monitoring to determine impacts to groundwater from the project implementation. Approximately seven thousand dollars (\$7,000) is budgeted for the monitoring program.
2. DNRC must approve the project scope of work and budget and the groundwater monitoring plan.
3. If Resource Indemnity Trust grant funds are approved and available for this project, Water Development grant funds shall not be used.

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APPLICANT NAME: Department of Natural Resources and Conservation, Water Management Bureau

PROJECT/ACTIVITY NAME: Development of a State-wide Strategy for Improving Irrigation Efficiency in Montana

AMOUNT REQUESTED: \$52,550 Grant

OTHER FUNDING SOURCES AND AMOUNTS: DNRC (In-kind) - \$10,774

TOTAL PROJECT COST: \$63,324

PROJECT DESCRIPTION:

The Water Management Bureau of the Department of Natural Resources and Conservation requests a grant of \$52,550 for the development of a state-wide strategy for improving irrigation efficiency in Montana. The proposal states three major objectives: 1) to develop a clearer understanding of agricultural water use efficiencies, 2) to identify opportunities for improving efficiencies, and 3) to develop a state-wide strategy for improving efficiencies.

The study will be conducted in three phases. The first phase will include an analysis to determine existing irrigation water use efficiencies in Montana. This will include an extensive literature and data search and a qualitative analysis, entailing field inspections and interviews with field operators, where efficiencies have not been measured. The first phase will also include a detailed description of the factors that determine irrigation water use efficiencies and explain how "optimal" efficiencies may vary based on site specific factors. This explanation will include real examples in Montana where optimal irrigation efficiencies are justifiably low, and other areas where they should be higher.

Phase II will identify specific areas of the state where irrigation efficiencies should be increased. The legal, institutional, and technological means to improve irrigation efficiencies will be examined. This phase will examine the economic and financial feasibility of implementing needed irrigation efficiency measures and consider the question of who should pay.

Phase III of the study includes the presentation of recommendations into a comprehensive program strategy for Montana. The result will be a published report incorporated into the state water plan for use in future water management decision making. The report will be completed within two years.

The effort will be commissioned to a qualified consultant and overseen by an Ad Hoc Technical

Advisory Committee composed of professionals from various state and federal agencies with experience in irrigation efficiency.

TECHNICAL ASSESSMENT:

The rationale behind the proposal is that there is a growing and serious need for water conservation through improved efficiencies. This need is apparent from a broad perspective including a large number of environmental, economic, and legal problem areas. Inefficient irrigation results in environmental problems including stream dewatering, water quality degradation, erosion, saline seep, and infestations of weeds and other pests. Economic problems include decreased crop yields and increased operating costs. The legal aspects of inefficient use include the concern that a possible future interstate apportionment may declare that some of Montana's water uses are unreasonable because of inefficiency. Recent Supreme Court cases indicate that existing uses in an upstream state may not be sufficient to justify an allocation of water. Conservation is important in justifying the beneficial use of existing competing appropriations. Montana law further addresses the issue in 85-2-101(3) and 85-2-114, MCA by associating beneficial use with conservation, and prohibiting the waste of water.

FINANCIAL ASSESSMENT:

The proposed budget includes \$45,000 for professional service, \$10,774 for DNRC contract administration (in-kind), and \$7,550 for operating costs.

No new full-time employees would be required to complete this project.

ENVIRONMENTAL ASSESSMENT:

The positive benefits associated with this project include improved state-wide water management to conserve agricultural water use. A successful program could result in improved water quality, reduced erosion, reduced saline seep, improved supplies, enhanced fisheries, and increased agricultural productivity.

RECOMMENDATION AND CONTINGENCIES:

The Department recommends a grant of up to \$52,550 contingent on approval of the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | Blaine County Conservation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Turner-Hogeland Irrigation and Aquifer Study |
| <u>AMOUNT REQUESTED:</u> | \$99,921 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Montana Bureau of Mines and Geology (MBMG) - \$50,774 |
| <u>TOTAL PROJECT COST:</u> | \$150,695 |

PROJECT DESCRIPTION:

Irrigation on the Turner-Hogeland plateau in north central Montana has developed rapidly over the last five years with thousands of acres of farmland being converted from dryland to sprinkler irrigation.

Water supply problems are occurring in portions of the Turner-Hogeland aquifer because of over 7,800 acres of sprinkler irrigation development supported by groundwater. Irrigated acreage is distributed over the entire aquifer but approximately 80% is concentrated in about two townships south and east of Hogeland, Montana.

Through this project the Blaine County Conservation District, in cooperation with the MBMG and the Soil Conservation Service (SCS), proposes to improve the viability of existing groundwater-supported irrigation from the Turner-Hogeland aquifer by providing useful information to those people attempting to manage the groundwater.

Implementation activities include illustrating cost-effective ways to lower irrigation water use by innovative sprinkler management, modification of distribution systems to reduce evaporation, and use of alternative crops which use less water. The aquifer recharge will be quantified, and the aquifer boundaries defined. Characteristics for selected areas within the aquifer will be obtained and used to manage groundwater levels in the heavily pumped portions of the aquifer by providing information necessary to develop well spacing standards. Lastly a computer groundwater flow model will be designed for the heavily pumped portion of the aquifer, using the data generated both from this study and water level data produced by an existing monitoring well network. The groundwater model will provide better estimates to local irrigators of the amount of water that can be safely pumped from the aquifer, and will help predict the results of management actions undertaken by the local management group, the Big Flat Water Users Association. The MBMG, a subcontractor of the Blaine County Conservation District, will be responsible for implementation of the project. The SCS will provide all technical assistance for cropping systems and on-farm data gathering.

TECHNICAL ASSESSMENT:

Technically the project presents a sound approach for systematically collecting hydrogeological information to fill in gaps in the aquifer data so that intelligent management decisions for water use in the area can be made. Interpretation of past groundwater assessments clearly demonstrate the serious depletion problems related to irrigation development in portions of the Turner-Hogeland aquifer. It is clear that the most effective and direct approach to the problem is to decrease the annual pumpage from within the heavily irrigated area and to increase spacing between existing irrigation systems.

Results from the irrigation and cropping modification may show viable means of reducing water consumption, but reviewers indicate it could be difficult to consistently implement and monitor on a large number of farm operations.

FINANCIAL ASSESSMENT:

Of the \$99,921 grant requested, \$20,769 is for salaries and benefits, \$6,400 is for Conservation District administrative costs, \$33,800 is for the irrigation equipment retrofit, seed and fertilizer costs, and an experimental crop protection fund. Monitoring well drilling, casing, logging, and testing costs total \$17,746. Water level recorders, analytical services and communications, and computer costs total \$5,600, and travel and per diem costs equal \$10,875. Indirect costs to the University System total \$4,731.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts are anticipated from this project. Positive impacts could result if use of the information prevents groundwater depletion within the aquifer.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$58,766 is recommended for the hydrogeologic portion of the project only. The grant is contingent on DNRC approval of the project scope of work and budget, and on commitment of the MBMG to provide \$50,774. The project must be coordinated with the Groundwater Information Center.

The budget was derived by subtracting the \$2,624 of indirect costs charged by the MBMG from the \$61,390 cost of the hydrogeologic portion of the project, and reducing the Conservation District's administrative charges from \$6,400 to \$3,776.

APPLICANT NAME: Montana Department of State Lands

PROJECT/ACTIVITY NAME: Snowshoe Creek Streambank Reclamation

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Department of State Lands (DSL)-Abandoned Mine Land Reclamation Program - \$11,400

TOTAL PROJECT COST: \$111,400

PROJECT DESCRIPTION:

The Montana Department of State Lands-Abandoned Mine Reclamation Bureau proposes to reclaim streambanks, floodplains, and disturbed areas in the Snowshoe Creek watershed near Libby which have been damaged from past hard-rock mining activities. The project site consists of several mine adits, a tailings dump area, and several wooden buildings. The tailings dump is located in and around Snowshoe Creek and is being eroded by the main creek and several small tributaries. The surface and groundwaters flowing through the tailings are leaching zinc and other metals out of the tailings and into the creek system. The leachate from the tailings has killed all fish and bottom life in the creek.

The proposed reclamation plan will restore the area to its natural state and eliminate visual or biological pollution. The mine adits will be collapsed and regraded. The tailings dump will be moved away from the creek, recontoured, and topsoiled. All disturbed areas will be revegetated.

TECHNICAL ASSESSMENT:

The reclamation techniques to be used are not innovative but have been used successfully by the DSL at other sites in Montana. Reviewers expressed concern that impacts to groundwater are not addressed in the off stream locations where the tailings are piled after being removed from the streams. Nor does the applicant address the need for treatment of drain water directed out of the mine adit. No groundwater monitoring is included in the plan, nor monitoring to assess pre- and post-project changes in stream water quality, fish and wildlife populations, or success of the revegetation.

FINANCIAL ASSESSMENT:

Of the \$11,400 total project cost, \$16,500 is for salaries of the contract administrator, engineer, inspector, technician, and typist. Travel and per diem costs are \$4,000 and printing costs total \$500. Construction labor and materials total \$76,500 and inflation and contingency, \$14,000. Cost estimates were calculated based on costs of similar reclamation projects. No economic cost/benefit assessment was submitted by the applicant. DSL-Abandoned Mine Land Reclamation funds were used to develop the reclamation plan.

ENVIRONMENTAL ASSESSMENT:

Short-term environmental impacts include the possibility of increased sediment production from instream construction activities, short-term erosion from the new spoils piles until the vegetation is reestablished, as well as some dust, noise, and degraded aesthetics during the construction period.

Potential exists for long-term groundwater contamination if the tailings are not properly isolated in this high precipitation, steep-sloped area.

Long-term impacts should be positive if the reclamation reduces or eliminates the heavy metal contamination of Snowshoe Creek.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends funding only two mine reclamation projects per biennium as there are numerous projects that need costly reclamation, and if several were funded per biennium with Water Development funds, DNRC would be unable to fund a variety of project types. Therefore DNRC recommends a grant of up to \$100,000 only if one of the two reclamation projects that ranked higher does not use its grant.

The grant is contingent on DSL establishing and implementing a groundwater monitoring plan for the reclamation site and on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Butte-Silver Bow Government and Mile High Conservation District

PROJECT/ACTIVITY NAME: Butte Metro Sewer Sludge Application and Plant Trials

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS:

Butte-Silver Bow, \$26,083; Soil Conservation Service (SCS), \$7,169; Montana Bureau of Mines and Geology (MBMG), \$750; Landowner, \$2,783

TOTAL PROJECT COST: \$135,354

PROJECT DESCRIPTION:

The Butte-Silver Bow government and the Mile High Conservation District propose to demonstrate the feasibility of using a high metal content municipal sludge for increased forage production on cropland, while minimizing soil and groundwater pollution.

The Butte-Silver Bow Metro Wastewater Treatment Plant produces 12 million gallons of sludge per year that contains excessive levels of heavy metals. The sludge is presently disposed on 60 acres of city-owned land at such high loading rates that groundwater contamination and surface soil sterilization is imminent. Increased nitrate and dissolved solids have been detected in the groundwater and the levels are expected to increase. An adjacent family farm has had several crop failures on their land from excessive sludge loading. They are reluctant to accept more sludge without demonstrated success. The state health authorities are pressing Butte-Silver Bow to change to an environmentally acceptable method of sludge disposal and use.

The demonstration project is designed to indicate the optimum forage crop, irrigation rate, sludge application rate, and soil conditioning required to maximize forage production and nutrient uptake while minimizing heavy-metal movement into plants and groundwater. Forage grasses and feed grains will be tested on plots with differing sludge application rates under irrigated and dryland conditions. The sludge, irrigation water, soil, groundwater, and forage tissue will be monitored for management of nutrients and heavy metals. Approximately 15 acres of family ranchland will be injected with sludge, and prepared for seeding. Two groundwater monitoring wells will be installed to supplement six existing wells. A hand-set irrigation system will be used for irrigating with sludge pond supernatant water and treatment plant effluent. Forage yields will be determined.

TECHNICAL ASSESSMENT:

Soil infiltration and sludge and groundwater monitoring data have been collected. Experienced consultants as well as personnel from the SCS, and MBMG have been and will be involved with the design and monitoring of the project. The Montana Department of Health and Environmental Sciences will regulate and control the project throughout its entirety.

This cropland application of the sludge is the preferred alternative over application at airport and park facilities, use in tailings, reclamation, disposal at a landfill, or sale as a soil conditioner because of odor and health concerns, low cost-effectiveness, and the potential for groundwater contamination.

While sludge application projects have occurred in other places in the United States, this is an innovative approach for use in Montana where heavy metal concentrations are so excessive and the weather and growing season unique. A smaller-scaled project of sewer sludge land application is ongoing in Helena. The two projects are different in their approaches, and together will provide a greater variety of information for other Montana communities interested in trying land applications of sludge.

FINANCIAL ASSESSMENT:

The total cost of this project is \$135,354 with Butte-Silver Bow providing \$26,083 for contract administration and labor. The SCS will provide \$7,169 for services of an environmental engineer and soil scientist. The landowner will provide \$2,783 for 50% of the labor cost. The MBMG will provide \$750 for equipment, and the grant contribution of \$100,000 will cover personnel costs for a plot attendant and consultant at \$32,806 and laboratory supplies, equipment, printing, analysis, contingency, and other costs at \$67,194. Costs appear reasonable and adequate.

ENVIRONMENTAL ASSESSMENT:

If current sewer sludge disposal methods in Silver Bow County continue, groundwater resources in the area are likely to become contaminated with heavy metals. This project proposes to identify a positive long-term environmentally sound solution to this problem through use of the sludge as a resource, while eliminating the threat to groundwater.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. These grant funds will not be awarded if the project is funded with Water Development funds approved in 1985, or with Resource Indemnity Trust grant funds.

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APPLICANT NAME: Ruby Valley Conservation District

PROJECT/ACTIVITY NAME: Short Creek Snotel

AMOUNT REQUESTED: \$22,567 Grant

OTHER FUNDING SOURCES AND AMOUNTS:

Ruby Valley Conservation District - \$150; Soil Conservation Service (in-kind) - \$2,000

TOTAL PROJECT COST: \$24,717

PROJECT DESCRIPTION:

The Ruby Valley Conservation District requests funds for the installation of automated snow, precipitation, and temperature recording equipment within the Short Creek Drainage, a tributary to the Ruby River. The equipment installation would be done by the Soil Conservation Service and would be a part of the Snotel snowpack monitoring network. The data obtained from the Short Creek Snotel site would allow improved management of the Ruby River Reservoir by more accurately predicting early-season, lower elevation spring runoff. The Short Creek Snotel site would complement three other Snotel sites presently located at higher elevations within the Ruby Valley drainage.

TECHNICAL ASSESSMENT:

The installation of the Short Creek Snotel site will be completed by the SCS in accordance with the standards and specifications for an SCS Snotel site. The Ruby Valley Conservation District will transfer ownership of the site to the SCS upon installation. The SCS will then provide for all future operation and maintenance of the site.

Although the Short Creek Snotel site may not be absolutely necessary to fully implement the Ruby Reservoir Operating Guide, the proposed station would provide additional data which would definitely improve streamflow forecasts and facilitate the operation of the reservoir. The greatest benefits would come in high, early-season runoff years.

FINANCIAL ASSESSMENT:

Installation of the proposed Short Creek Snotel site is feasible within the proposed budget of \$24,717. The proposed expenditures have been analyzed by the SCS Snow Survey staff. Annual maintenance costs are estimated to be \$3,000 and will be covered by the SCS. Budget limitations have precluded the installation of new Snotel sites with SCS funds.

ENVIRONMENTAL ASSESSMENT:

The installation and operation will have little or no impact on the Short Creek Snotel site itself. However, data provided by the station could result in improved reservoir management, stabilizing flows in the Ruby River. More stable flows will reduce streambank erosion and sedimentation, improve fish and wildlife habitat, and increase public recreation opportunities.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$22,567 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Department of Natural Resources and Conservation/
Conservation Districts Division

PROJECT/ACTIVITY NAME: Agricultural Riparian Area Rehabilitation Project

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Environmental Protection Agency (EPA)/Department of Health and
Environmental Sciences (DHES) - \$20,000; DNRC Conservation
Districts Division/223 - \$5,300; Soil Conservation Service (SCS),
DNRC, DHES (in-kind) - \$25,000; DHES/EPA (in-kind) - \$6,428

TOTAL PROJECT COST: \$156,728

PROJECT DESCRIPTION:

The purpose of this project is to address riparian stream corridor erosion and land management problems as they relate to agricultural influences. The specific objectives are to complete the inventory and planning phase on three rivers - the Sun River, East Gallatin River, and the Musselshell River - and to implement the needed improvement practices identified in previously completed management plans on the Smith River and Otter Creek.

Each of these streams has been identified by conservation districts as a major contributor to the nonpoint source pollution problem in Montana. The funding requested in this application would be used to continue a cooperative effort by DNRC, DHES, SCS, and EPA to identify problems in various stream corridors and to develop corrective plans and practices. These agencies will continue to contribute to this proposed project.

Funding from DNRC will be provided to the local conservation districts for project planning or for project implementation. The planning on the Smith River and Otter Creek will be completed by 1987 and the requested funds will be used only for implementation. Approximately \$60,000 will be applied to improve critical areas of these streams.

The remaining funds will be used to complete planning activities on the Sun, Musselshell, and East Gallatin rivers. The planning will consist primarily of a physical inventory conducted by DHES, DNRC, SCS, and the CDs, and the development of stream corridor improvement and rehabilitation plans for each stream.

TECHNICAL ASSESSMENT:

The stream reach inventory methodology was developed principally by the SCS and has been used successfully by various state and federal agencies to identify stream corridor management problems. The streams addressed in this application have been identified as problem areas in conservation district long range plans and in agricultural nonpoint source assessments.

It should be noted that the \$60,000 requested for implementation of corrective actions on Smith River and Otter Creek can only be used to treat some critical areas and to demonstrate what can be done to correct existing problems. Corrective measures will consist primarily of vegetative streambank

stabilization, stream channel stability measures, and fencing of critical areas, with very limited use of structures and riprap.

FINANCIAL ASSESSMENT:

The total project cost is estimated at \$156,728. Actual construction costs are estimated at \$60,000. The DNRC/223 program has provided \$5,300. In-kind services provided by SCS, DHES, DNRC, and EPA are estimated to be \$31,248, which includes salaries for technicians, engineers, and biologists, and supplies, mapping costs, and other miscellaneous expenses. Management plans on each of the three streams will be prepared by contractors through a competitive bid process.

ENVIRONMENTAL ASSESSMENT:

Implementation of riparian management plans will have positive environmental impacts through reduction of streambank erosion, improved water quality, and enhancement of fish and wildlife habitat.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on approval of the project scope of work and budget.

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APPLICANT NAME: Yellowstone Conservation District

PROJECT/ACTIVITY NAME: Yellowstone County Groundwater Study

AMOUNT REQUESTED: \$85,230 Grant

OTHER FUNDING SOURCES

AND AMOUNTS: Yellowstone Conservation District - \$1,000; Montana Bureau of Mines & Geology (MBMG) - \$31,500

TOTAL PROJECT COST: \$117,730

PROJECT DESCRIPTION:

The Yellowstone Conservation District requests funding to collect, compile, and interpret all the existing groundwater data available for the urban and urban rural fringe areas of Yellowstone County, and to use that data to compile maps and other tools to be used in making decisions on land use planning and groundwater development and protection.

All work will be done by MBMG (Billings office) personnel. Analyses will be conducted by the MBMG lab in Butte. The conservation district will serve as a liaison between MBMG personnel and local government and will handle the grant administration. MBMG will compile the data, interpret the results, and produce the final report under the guidance and advice of the conservation district.

The final products will be: a written report containing interpretations of hydrogeological conditions; a map showing areas unsuitable and suitable for landfills, feedlots, and similar activities; a map showing where future subdivisions and homesites must, may, or won't need cisterns or other non-groundwater supply; a map showing approximate depths to the water table; a map showing areas and depths to the best groundwater supply for stock or domestic uses; maps portraying groundwater flow directions, recharge/discharge, and other conditions; and appendices of all available data.

TECHNICAL ASSESSMENT:

Yellowstone County has a history that is rife with water rights conflicts, decreasing or nonexistent groundwater supplies, and degradation of shallow aquifers from septic tank and/or industrial effluents.

A project to systematically collect and disseminate hydrogeologic information in Yellowstone County will lead to better management and protection of groundwater in the area. Reviewers of this proposal have expressed concern, however, that a more detailed methodology needs to be developed to better define the specifics of the project. Because there is a recognized lack of the aquifer data in the area, production of maps could be premature and the maps could be inaccurate. Reviewers don't feel there

are enough existing data available to provide the information needed to develop accurate maps for making planning decisions. The compilation of existing data planned in the proposal is only a good first phase of a much needed detailed hydrogeologic study of the urban Billings and rural fringe area, and can be accomplished at a reduced level of funding.

FINANCIAL ASSESSMENT:

Of the \$117,730 total project cost, \$78,690 is for salaries of two hydrogeologists, a technician, and a secretary. Water quality analysis and publication costs total \$12,000, indirect costs to the MBMG equal \$15,740, and travel, computer costs, administration, and supplies total \$11,300.

Salary costs appear excessive for the limited amount of field work needed and when considering that the overall focus is on compilation of existing data.

Neither the City of Billings nor Yellowstone County are contributing financially to the project even though they will be the primary users and beneficiaries of the project. However, they have expressed strong support for the project. The MBMG is contributing \$31,500 toward salaries, and the conservation district \$1,000 toward administration.

ENVIRONMENTAL ASSESSMENT:

No adverse impacts will result from the implementation of the project.

RECOMMENDATION:

DNRC recommends a grant of 75% of the total project cost up to \$44,000 for the first phase of a hydrogeologic study that would entail compilation of existing data and design of a full study. The recommendation is contingent on documentation of commitment for the remaining 25% of the project cost, some of which must be from Yellowstone County. No indirect costs to the MBMG shall be paid with grant funds.

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| <u>APPLICANT NAME:</u> | Rosebud & Big Horn Conservation Districts |
| <u>PROJECT/ACTIVITY NAME:</u> | Coal Lands Groundwater Monitoring |
| <u>AMOUNT REQUESTED:</u> | \$98,160 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Conservation Districts - \$2,000; Montana Bureau of Mines and Geology (MBMG) - \$19,150 |
| <u>TOTAL PROJECT COST:</u> | \$119,310 |

PROJECT DESCRIPTION:

Coal beds being mined in southeastern Montana are the most productive and accessible aquifers available to the agricultural community there. To provide information needed to understand the effects of mining on these aquifers, the Montana Bureau of Mines has, since 1970, conducted hydrologic investigations and has monitored groundwater conditions in southeastern Montana.

With these grant funds, the MBMG, under contract with the Rosebud and Big Horn conservation districts, will (a) maintain the continuity of water level and quality records as surface coal mining proceeds; (b) consolidate and streamline the many records into easily interpretable form; (c) provide quarterly updates on conditions for Montana Department of State Lands, for the Office of Surface Mining, and for mine operators; and (d) provide immediate updates for any concerned individual, agency, or company. The overall objective is to provide knowledge of the long-term impacts of protracted mining on eastern Montana's groundwater resource.

TECHNICAL ASSESSMENT:

The value of an uninterrupted, long-term hydrologic data base in these areas is unquestionably great, and well described in the proposal. The Department of State Lands Reclamation Bureau (Coal Division)

reports that they make extensive use of MBMG's work in assessing the cumulative impacts of multiple mine development and the cross-border impacts of Wyoming coal mines. The on-site monitoring required of the companies by DSL cannot accomplish these regional goals. DSL cannot require the companies to expand their monitoring program beyond their property boundaries, so regional monitoring responsibilities probably would not be assumed by other parties. There is clearly a need for continued regional study on the part of an independent entity such as MBMG.

The proposed program will not lead to a discrete product, but rather will contribute to the updating of an important information base. Narrative reports on the hydrogeologic status of the areas will be provided.

FINANCIAL ASSESSMENT:

The budget provides \$74,980 for one professional hydrogeologist (15 months), one technician (10 months), and a senior hydrogeologist (4 months) over the two-year project duration. Indirect costs are \$15,000 calculated at a rate of 20% of salaries and benefits. Costs estimated from past experience with similar projects include \$12,430 for travel, \$3,000 for computer and office supplies, and \$11,900 for water analysis and sampling supplies. The conservation districts will contribute \$2,000 for contract administration.

The proposed budget includes substantial expenditures for data analysis and presentation. These aspects could be postponed without permanently losing information, but at the cost of making that data less accessible to users. Reduction could occur in the area of salaries.

From 1970 through 1986, the observation well network, monitoring program, and data system evolved and were maintained under projects supported by the Environmental Protection Agency, Office of Water Resources Technology, Old West Regional Commission, U.S. Geological Survey, and the Montana Coal Board. Now these special funding programs have been eliminated, and the continuity of critical water-level and water-quality records is jeopardized.

No long-term funding source is identified for this project. The Montana Coal Board requested that the MBMG seek funding through the Water Development Program for the 1988-1989 biennium rather than through the Coal Board.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will occur as a result of this project. Positive impacts would result if data is used to make decisions that will help protect the groundwater resources.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for this project. As is demonstrated by the ranking this project received (#25), DNRC recognizes that the baseline data collection portion of this project is extremely important in providing information for the long-term impacts of coal mining in Eastern Montana. However, DNRC feels that the Water Development Program is not an appropriate funding source for this long-term monitoring program, and therefore recommends that the applicants request funding from the Montana Coal Board, which has provided funding for this program in the past.

APPLICANT NAME: Private Individual

PROJECT/ACTIVITY NAME: Gravity Sprinkler Project

AMOUNT REQUESTED: \$30,318 Grant, \$90,954 Loan, \$121,272 Total

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$5,000

TOTAL PROJECT COST: \$126,272

PROJECT DESCRIPTION:

The project sponsor proposes to convert 254 acres of flood irrigated hay and pasture to gravity sprinkler irrigated hay. The delivery pipeline will be shared with a neighbor who proposes, in a separate application, to convert 382 acres of flood and pump sprinkler irrigated hay to gravity sprinkler irrigated hay.

The project area is located five miles south of Drummond and consists of deep, well-drained, clay loam soils on 0 to 9% slopes. Presently, the project sponsor and his neighbor divert water out of Douglas Creek, transport it across a divide and irrigate lands adjacent to Barnes Creek. Both creeks are tributaries of Flint Creek. The present system significantly dewateres Douglas Creek and degrades the water quality in Barnes Creek as well as encouraging excessive soil loss. The steep slopes make it difficult to flood irrigate efficiently and require numerous drop structures to maintain grade. These structures require considerable maintenance and regular replacement.

Installation of the proposed project will conserve 60% of the water diverted out of Douglas Creek, and will significantly increase flows in Douglas Creek. Water quality in Barnes Creek will be improved, as will the fishery in Douglas Creek. The project will also conserve energy, reduce erosion, improve crop production, and reduce operation and maintenance costs.

TECHNICAL ASSESSMENT:

The supply and delivery system will use 27,350 feet of PVC pipe ranging in size from four to fifteen inches in diameter. The existing ditch from Douglas Creek will deliver water to the gravity pipeline. The remaining portion of the ditch will be reclaimed and any excessive water delivered to the pipeline will be spilled into Gaskil Creek by means of an overflow pipe. All appurtenances, such as pressure reducing valves, air and intake vacuum valves, and drains, will be installed as required.

On-farm treatment will include installing wheel lines, closing ditches, seeding areas disturbed by construction, and applying conservation cropping systems.

The SCS has performed a preliminary analysis and determined the project to be technically feasible. The analysis performed is adequate and the project appears to be technically sound. The final design, cost estimates, and specifications will be reviewed prior to funding to ensure project feasibility.

The Flint Creek Preliminary Temporary Decree has been issued and no objections were filed against the project sponsor's water right claim.

FINANCIAL ASSESSMENT:

The project cost with a 25% grant is \$40/acre and the project benefits are \$41/acre, resulting in an increase in net revenue of \$1/acre. The project sponsors do not plan to implement the project without grant funding.

The cost figures presented in the preliminary design seem reasonable and are consistent with like projects and available unit cost data.

ENVIRONMENTAL ASSESSMENT:

There are no known adverse environmental impacts associated with this project except for the short-term disturbance created by the construction of this project. Any areas disturbed by construction will be reseeded.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$17,967 is recommended contingent on DNRC approval of the project scope of work and budget.

The loan request will be considered under the Water Development Private Loan Program.

APPLICANT NAME: Private Corporation

PROJECT/ACTIVITY NAME: Gravity Sprinkler Project

AMOUNT REQUESTED: \$50,000 Grant, \$150,000 Loan, \$200,000 Total

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$5,000; Project Sponsor - \$19,128

TOTAL PROJECT COST: \$230,128

PROJECT DESCRIPTION:

The project sponsor proposes to convert 382 acres of flood and pump sprinkler irrigated hay and pasture to gravity sprinkler irrigated hay. The delivery pipeline will be shared with a neighbor who proposes, in a separate application, to convert 254 acres of flood irrigated hay to gravity sprinkler irrigated hay.

The project area is located five miles south of Drummond and consists of deep, well-drained, clay loam soils on 0 to 9% slopes. Presently, the project sponsor and his neighbor divert water out of Douglas Creek, transport it across a divide and irrigate lands adjacent to Barnes Creek. Both creeks are tributaries of Flint Creek. The present system significantly dewateres Douglas Creek and degrades the water quality in Barnes Creek as well as encouraging excessive soil loss. The steep slopes make it difficult to flood irrigate efficiently and require numerous drop structures to maintain grade. These structures require considerable maintenance and regular replacement.

Installation of the proposed project will conserve 60% of the water diverted out of Douglas Creek, and will significantly increase flows in Douglas Creek. Water quality in Barnes Creek will be improved, as will the fishery in Douglas Creek. The project will also conserve energy, reduce erosion, improve crop production, and reduce operation and maintenance costs.

TECHNICAL ASSESSMENT:

The supply and delivery system will use 27,350 feet of PVC pipe ranging in size from four to fifteen inches in diameter. The existing ditch from Douglas Creek will deliver water to the gravity pipeline. The remaining portion of the ditch will be reclaimed and any excessive water delivered to the pipeline will be spilled into Gaskil Creek by means of an overflow pipe. All appurtenances, such as pressure reducing valves, air and intake vacuum valves, and drains, will be installed as required.

On-farm treatment will include installing wheel lines, closing ditches, seeding areas disturbed by construction, and applying conservation cropping systems.

The SCS has performed a preliminary analysis and determined the project to be technically feasible. The analysis performed is adequate and the project appears to be technically sound. The final design, cost estimates, and specifications will be reviewed prior to funding to ensure project feasibility.

The water right claims for this project have been reviewed by DNRC's adjudication staff and (based on a 1978 photo), all acres have been historically irrigated except for a portion of 80 acres of new irrigation. A change of use permit or new appropriation permit must be filed for any acres not covered under the original claims. The Flint Creek Preliminary Temporary Decree has been issued and no objections were filed against the project sponsor's claims.

FINANCIAL ASSESSMENT:

The project cost with a 25% grant is \$45/acre and the project benefits range between \$56 and \$66/acre, resulting in an increase in net revenue between \$11 to \$21/acre. The project cost without a 25% grant is \$60/acre, with the same benefits of between \$56 and \$66/acre resulting in a change in net revenue between -\$4 and \$6/acre. The project sponsors do not plan to implement the project without grant funding.

The cost figures presented in the preliminary design seem reasonable and are consistent with like projects and available unit cost data.

ENVIRONMENTAL ASSESSMENT:

There are no known adverse environmental impacts associated with this project except for the short-term disturbance created by the construction of this project. Any areas disturbed by construction will be reseeded.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$32,033 is recommended contingent on DNRC approval of the project scope of work and budget. The loan request will be considered under the Water Development Private Loan Program.

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APPLICANT NAME: Department of Natural Resources and Conservation/Water Management Bureau

PROJECT/ACTIVITY NAME: Musselshell River Basin Water Availability Study

AMOUNT REQUESTED: \$60,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS:

Water Management Bureau (WMB) (in-kind) - \$41,000; United States Bureau of Reclamation (USBR) - \$95,000; United States Geological Survey (USGS) - \$50,000

TOTAL PROJECT COST: \$246,000

PROJECT DESCRIPTION:

The goal of this proposed study is to collect the data necessary for the implementation of a water management and improved irrigation efficiency program for the Musselshell River Basin.

Water users within the Musselshell River Basin requested that the WMB of DNRC, the USBR, and the USGS provide assistance and technical support in identifying ways to improve water management and availability for irrigation use. As a result, the USGS and USBR agreed to provide a total of \$145,000 toward the study which must be matched with state funds.

The study will be focused primarily in the Deadman's Basin water supply system and the Lower Musselshell River. However, the Upper Basin and the Flat Willow drainage may also be included if it is determined these areas are critical for defining basin-wide water supply problems.

This specific proposal is for Phase I in the development and eventual implementation of the water supply plan. Phase I includes the data gathering and solution identification. Phase II will determine the feasibility and effectiveness of those identified alternatives, and Phase III will be the actual implementation of the plan.

Specific objectives to be accomplished under Phase I include:

1. Identification and quantification of existing water rights.
2. Identification of irrigated land and methods of irrigation.
3. Comparison of water use requirements with amounts of water being actually diverted.
4. Measurement of flows in the natural drainages and water delivery systems.
5. Development of a water supply model to assess basin irrigation needs from which a water management plan can be developed.

TECHNICAL ASSESSMENT:

A very real water management/water supply problem does exist for irrigators in the Musselshell River Basin. Irrigation water shortages have been reported as early as 1932. In 1982, DNRC reported that irrigation water demand on the Musselshell will be met in eight out of ten years only until July 10 at Mosby, June 23 at Musselshell, June 30 at Roundup, and May 31 at Ryegate.

This study will attempt to quantify shortages and surpluses of water in the basin through the installation of continuous recording flow measurement stations and other measuring devices. Flow data

will then be interpreted by hydrologists from the involved agencies and used in the development of the water supply model for the basin. Flows will be measured for at least two irrigation seasons and this data will be correlated with existing gauging stations on the river and at heads of major state project supply canals.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$246,000. These expenses will be shared by the USBR, DNRC, and USGS either through direct expenditures, in-kind services, grant money, or cost-share programs. The WMB will administer its in-kind contribution, this grant, and the USGS cost-share money. Expenditures will be made over a three-year period, with the largest expense occurring the first year for the installation of gauging stations.

DNRC will use \$50,000 of the grant to cost-share with the USGS for the installation of approximately 25 gauging stations. The remaining \$10,000 will be used for travel, materials, and computer time.

The availability of the federal funds for this study is dependent upon state cost-share funds.

ENVIRONMENTAL ASSESSMENT:

No environmental impact is anticipated as a result of this phase of the project. Once flow mitigation alternatives have been identified, the potential environmental impacts will have to be assessed.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$60,000 is recommended to allow full utilization of the federal match funds. Availability of the grant funds is contingent upon DNRC approval of the scope of work and budget.

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| <u>APPLICANT NAME:</u> | Lower Yellowstone Conservation District Development Committee (LYCDDC) |
| <u>PROJECT/ACTIVITY NAME:</u> | Pick-Sloan Power For Irrigation Pumping |
| <u>AMOUNT REQUESTED:</u> | \$65,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | LYCDDC (In-kind) - \$2,300 |
| <u>TOTAL PROJECT COST:</u> | \$67,300 |

PROJECT DESCRIPTION:

The Lower Yellowstone Conservation District Development Committee (LYCDDC) was formed in 1983 by six conservation districts in the Lower Yellowstone River basin to pursue development of their water reservations. The group has investigated a variety of development strategies including the use of low-cost power for irrigation pumping available under the Pick-Sloan Missouri River Basin Plan of the federal government. This grant will fund a Bureau of Reclamation assessment of three existing irrigation projects to satisfy the conditions necessary for congressional authorization of such power to each project.

Pick-Sloan power is federal power generated at mainstem reservoirs on the Missouri River. Under the federal mainstem development plan initiated in 1944, irrigation was to be developed by the Bureau of Reclamation as a primary benefit to impacted Missouri River basin states. Low-cost power was reserved for irrigation development along with power revenues for project funding. Only a small portion (approximately 5%) of the planned development has been realized in Montana. The applicant argues that Congress is not likely to fund many new projects and that the power planned for irrigation will not be used unless existing projects can acquire it.

The project is intended to demonstrate a mechanism for future acquisition of low-cost Pick-Sloan power for existing irrigation projects in the state's Missouri River basin. The Water Resources Division of DNRC would coordinate this basin-wide effort to acquire the low-cost power if the demonstration is successful.

TECHNICAL ASSESSMENT:

The projects proposed for Bureau of Reclamation assessment and eventual congressional authorization include the Hammond, Hathaway, and Heidle irrigation projects. The projects serve over 25 irrigators on 7,000 acres. The LYCDDC has screened a six-county area and selected these projects to demonstrate the concept.

Two of the projects are considered low-head projects which include primary pump lifts of around 30 feet. The third project is a high-head project which lifts water nearly 400 feet.

Acquisition of Pick-Sloan power would provide the low-head projects an energy savings of approximately \$4.00 per acre per year at today's prices. The high-head project could save up to \$30.00 per acre per year. The level of savings will increase as energy prices escalate, since the Pick-Sloan rate is fixed.

The process for authorization of Pick-Sloan power on existing projects is not fully defined since the power has traditionally been reserved for new development. It does require Bureau of Reclamation concurrence that the projects qualify as "Bureau Projects" under their programs. This requires an assessment of the irrigated lands, drainage conditions, system serviceability, and repayment capacity. The Bureau has estimated the assessment will cost \$65,000 or \$9.29 per acre for the three proposed projects.

Once the projects are determined acceptable, the LYCDDC will request congressional authorization for Pick-Sloan power.

FINANCIAL ASSESSMENT:

The project budget includes \$65,000 for Bureau of Reclamation assessments and \$2,300 for LYCDDC in-kind services.

The Bureau of Reclamation costs could be decreased by 50% if there are available funds in the Bureau's state assistance budget for which the state authorizes use.

The probability of congressional authorization for these projects is very uncertain. The applicant has sensed from Montana's delegation that there is a reasonable chance since the proposals would be at no cost to the federal government.

ENVIRONMENTAL ASSESSMENT:

No impacts will result directly from the assessment. Long-term impacts could be positive if the power savings were diverted to much needed system rehabilitation.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$32,500 is recommended contingent on DNRC approval of the project scope of work and budget. The remaining funds required for the budget should be requested through the U.S. Bureau of Reclamation's state assistance fund.

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| <u>APPLICANT NAME:</u> | Carbon County |
| <u>PROJECT/ACTIVITY NAME:</u> | Roberts Water System Improvements |
| <u>AMOUNT REQUESTED:</u> | \$47,500 Grant; \$142,500 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$190,000 |

PROJECT DESCRIPTION:

The Town of Roberts is a small unincorporated community of approximately 200 people located in Carbon County. The town's water supply consists of two wells. Water from the wells is pumped to a

5,000-gallon storage pressure tank. The distribution system consists of 2,400 feet of 6-inch pipe and 4,310 feet of 4-inch pipe.

Roberts suffers from water shortage. The existing pumping system is inadequate to meet maximum water demands. Small line sizes in the distribution system complicates the water shortage problem, with pressure dropping below acceptable levels during high use demand situations. In addition to the water shortage problem, the chlorine feed system is dangerous and a hazard exists for those working near or in the pump station.

This project will provide an adequate water supply for the residents of Roberts, by improving the system's chlorine detention time, resolving safety hazards, and renovating deteriorated distribution conditions.

TECHNICAL ASSESSMENT:

The town hired a consulting engineering firm to complete a "Master Plan for Improvements to the Water System" which identified the water system deficiencies and recommended three alternatives for improvement. Final alternative selection will depend upon test results that will show the safe yield of the existing wells. It is anticipated that the existing wells will not yield more than 200 gallons per minute (gpm) and under this scenario, the alternative selected will be to drill a new well to bring the supply up to a 350 gpm production. The new well will be constructed in parallel with the existing system and the pumps will be sized down to accommodate the well capacity. The pumphouse piping will also be upgraded to eliminate a pipe restraint problem.

The chlorination system will be upgraded to remove the hazardous situation, and existing electrical controls will be upgraded. A new 5,000-gallon pressure tank will be added in parallel with the existing 5,000-gallon tank, which will be reconditioned. This will give the system the proper chlorine detention time. A new 6-inch water line will be installed to resolve low operating pressures, and to create a loop in the system, thus eliminating a dead end.

The proposed alternative is appropriate, technically feasible, and should produce the desired effects. A detailed cost estimate of the improvements has been developed. The design of all improvements will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences prior to starting construction. The WQB agrees that there is a need for the project but may not approve the alternative selected since the "Recommended Standards for Water Works" states that pressure tanks should not provide the only storage facility when serving more than 50 homes.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$190,000 of which \$143,019 are costs of construction and contingencies and the balance is engineering, legal, administration, and interest. The applicant requested a grant of \$47,500 and a loan of \$142,500. The estimated project costs appear to be realistic and reasonable and it appears as though the most cost-effective alternative was chosen.

There are 103 water users in Roberts now paying an average of \$11.72 per user per month for operation and maintenance of the water and sewer systems, along with some debt retirement. The average user's rate will increase to \$27.62 per month with the new improvements.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with municipal utility construction projects.

RECOMMENDATIONS AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$47,500 and a loan for the remaining amount is recommended contingent upon DNRC approval of the project scope of work and budget and on Roberts completing the steps necessary for bond issuance. If grant funding is not available for this project, Carbon County may request a loan for the entire amount of the total project cost. Any reduction in the scope should result in a proportionately smaller grant and should not affect priority improvements. The Water Quality Bureau must approve the design of the selected alternative before DNRC funds will be disbursed.

APPLICANT NAME: Private Companies

PROJECT/ACTIVITY NAME: Irrigation Diversion Rehabilitation

AMOUNT REQUESTED: \$11,588 Grant

OTHER FUNDING SOURCES
AND AMOUNTS:

Private Companies - \$11,588; Agricultural Stabilization and Conservation Services (ASCS) - \$23,175

TOTAL PROJECT COST: \$46,351

PROJECT DESCRIPTION:

The purpose of this project is to rebuild a concrete irrigation diversion in a side channel of the Yellowstone River. The structure will divert water to the headgate used by the irrigation ditch companies. The project area is located about five miles west of Park City in Yellowstone County.

In recent years the diversion channel has been filling with gravel, requiring dredging the channel each spring to allow water to flow to the headgate. During low flow periods it has been difficult to divert enough water to supply adequate irrigation water for the approximately 5,900 acres under the two ditches.

The new diversion structure will be a rock riprap reinforced concrete headwall about one foot higher than the existing structure. No additional land will be irrigated as a result of this project, but with the diversion of the full 150 cubic feet per second flow, late season and low flow year irrigation will be much more dependable.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) has been working with the ditch companies for the last several years developing comprehensive improvement plans for the two ditches. A private engineer has been employed to design the headwall diversion structure, and it will be designed and constructed in accordance with SCS standards.

The headwall diversion will be constructed so that flashboards can be installed during periods of low flows. It is projected that the construction and completion of the project will take six months, beginning in July and ending in December.

The applicants have made initial contact with the Army Corps of Engineers and the conservation district for the required 404 and 310 permits.

FINANCIAL ASSESSMENT:

Total projected costs for the project are \$46,351. This application is for a 25% grant. Additional anticipated funding sources are ASCS (\$23,175) and a \$10,988 Water Development loan from DNRC's private loan program, if this grant request is approved. ASCS funds have not yet been secured.

The two ditch companies are assessed at equal rates of \$1.50/share. Each share represents 2.5 acres and on the average there are four assessments/year, totaling \$6.00/2.5 acres.

ENVIRONMENTAL ASSESSMENT:

Short-term increases in silt loads and turbidity will occur during the construction phase; however, downstream turbidity increases will be minimized because construction will take place within the dewatered side channel. Long-term improvements to water quality and fish habitat will be the result of a stable river bottom which will no longer require yearly disturbance of the diversion channel.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$11,588 is recommended contingent on DNRC approval of the project scope of work and budget. The grant is also contingent upon the approval of the loan from DNRC or securing full project funding from other funding sources.

APPLICANT NAME: Eastern Sanders County Conservation District

PROJECT/ACTIVITY NAME: Little Bitterroot Valley Recharge Enhancement and Conservation

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Montana Bureau of Mines and Geology (MBMG) - \$10,500

TOTAL PROJECT COST: \$110,500

PROJECT DESCRIPTION:

The groundwater irrigation source in the Little Bitterroot Valley is the Lone Pine aquifer, a very productive 20- to 60-foot-thick gravel bed continuous over the 25-mile-long lowland reach of the Little Bitterroot River located south of Kalispell in eastern Sanders County. Groundwater irrigation usage began in 1910. An estimated 1,000 to 2,000 acre-feet per year is now used for irrigation, primarily from high-capacity flowing wells.

The aquifer has experienced both long- and short-term water level declines caused by irrigation withdrawals. Short-term declines are the result of concurrent use of the aquifer by irrigators in the summer months; long-term declines are caused by sustained withdrawals in excess of the aquifer recharge rate. Against protests and formal water rights objections, applications for new wells and demand for additional groundwater continue.

To address this problem, the Eastern Sanders County Conservation District, in cooperation with the MBMG, proposes to enhance aquifer recharge by developing a pilot recharge injection facility using an existing, high-capacity well, into which excess spring runoff will be diverted rather than wasted. The MBMG will also assist well owners with "runaway" or excessively flowing wells to stop this waste of groundwater. If successful, the project will conserve and store between three and six acre-feet/day of water which is now unused or wasted. This amount could more than double the rate at which recharge now replenishes groundwater in the aquifer.

This proposal was also submitted to the U.S. Bureau of Reclamation (USBR), as Phase A of a multi-phase artificial recharge demonstration project. If both state and federal proposals are funded, federal funds will match state funds on a 4:1 basis. If they become available, the USBR funds will be used to extend the injection project to a 7 acre-feet/day injection wellfield, to be integrated into the Flathead Irrigation Project. The success of this proposal is not dependent on USBR funds.

TECHNICAL ASSESSMENT:

The problem is well-defined and documented. The proposed program of assisting with "runaway" wells demonstrates attention to conservation as a mitigative measure.

The proposal incorporates several innovative ideas. The artificial recharge plan is a unique and potentially effective response to reduced levels in the aquifer. However, there is uncertainty regarding the willingness of the Confederated Salish and Kootenai tribes to cooperate with the artificial recharge aspects of the problem. The tribal government's claim to instream flow in the Little Bitterroot has not been resolved nor even firmly quantified by the tribes. Easements and site access for the project are held by the cooperating Flathead Irrigation Project or by cooperating ranchers.

Water quality effects will be monitored closely. Sediment will be removed prior to injection to a level which will likely not disturb nearby wells. Biological contamination would be unlikely due to filtration. Potential contamination from the use of agricultural chemicals was not addressed. The Soil Conservation Service will provide engineering services for the design of the irrigation and sediment removal works.

No commitment to long-term monitoring or aquifer management at the local level has been made, nor has a local management entity been identified.

FINANCIAL ASSESSMENT:

Of the total project cost of \$110,500, \$45,700 is for the salary and benefits of a hydrogeologist. Drilling costs total \$28,000 and chemical analyses \$2,500. Labor, equipment, and materials total \$13,000 and travel costs are \$5,600. Contract administration totals \$2,000 and indirect costs to the MBMG total

\$13,700. Costs appear reasonable and adequate. If federal funds are received, they will match the state grant of \$100,000 at \$400,000. No local funds are contributed to this project.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts are likely to occur, provided the water recharged to the aquifer is of acceptable water quality.

RECOMMENDATION AND CONTINGENCIES:

A grant of \$86,300 is recommended contingent on the following:

1. Commitment from the Eastern Sanders County Conservation District that they will identify a local entity who will agree to provide long-term management of the aquifer recharge project.
2. Identification of a funding source to provide long-term operation and maintenance of the injection well, and estimates of what these costs will be.
3. Commitment from USBR to provide the federal matching funds.
4. DNRC approval of the project scope of work and budget.

The \$86,300 figure was reached by subtracting the \$13,700 of indirect costs charged by the MBMG from the \$100,000 grant request.

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APPLICANT NAME: Whitefish County Water & Sewer District

PROJECT/ACTIVITY NAME: Whitefish Basin Water Quality Enhancement

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES

AND AMOUNTS: Whitefish County Water & Sewer District - \$19,000; Montana Bureau of Mines & Geology (MBMG) - \$21,000

TOTAL PROJECT COST: \$140,000

PROJECT DESCRIPTION:

The Whitefish County Water and Sewer District was established in 1982 to address water quality problems in the Whitefish Basin and in Whitefish Lake, which is the water supply for the city of Whitefish and lakeshore residents. The district includes approximately 39,000 acres around the lake and serves an estimated population of 2,200. In 1983 the district was awarded a \$100,000 Water Development grant to complete a resource inventory and management plan for the district, and to complete a limnology study of the lake. The results of the limnology study confirmed that the lake demonstrates a trend toward premature eutrophication, that an oxygen deficit exists, and that continuing input of phosphorus will result in rapid deterioration of the lake's water quality.

The proposed project will build from the limnology study and provide for the identification and mapping of specific areas of sewage contamination and determine the nature of the contaminants. A feasibility study of treatment alternatives is proposed for these critical areas to identify locations that can be served by the Whitefish sewage treatment facilities or individual or package treatment alternatives. A consulting engineering firm has been hired by the district and this work has been completed. A groundwater study is also proposed for the area to identify recharge and discharge areas, groundwater quality, and depth and direction of flow. Areas of contaminated groundwater and areas particularly sensitive to contamination will be identified. The district expects that the Montana Bureau of Mines and Geology (MBMG) will conduct the groundwater study and the MBMG has indicated that matching money may be available. The critical area study and the groundwater study will be incorporated in the Water Management Plan, and will form the basis for an EPA Construction Grants application. The proposal also provides for the continuation of the district manager position to coordinate special studies, continue a public education program, and prepare implementation programs under the Water Management Plan.

TECHNICAL ASSESSMENT:

General areas of contamination from sewage leachates in the lake have been identified. Further work in ground-truthing seeps and failing septic systems to identify specific contributors will be accomplished through lab testing and further dye testing. The Montana Bureau of Mines and Geology is an acknowledged authority in groundwater analysis and has prepared a thorough study plan for the District.

The opportunity to coordinate surface and groundwater studies for the area is considered advantageous for both studies and could enable the district to develop both water supply and sewage treatment recommendations for the area. This approach addresses the most critical problems revealed in the District's work thus far and demonstrates a logical progression in its management program. The work as proposed appears to be technically feasible and should address the problems identified.

FINANCIAL ASSESSMENT:

The total project cost is estimated at \$140,000, with the district requesting a grant of \$100,000. The MBMG has allowed for a \$21,000 contribution and the district will supply the remaining \$19,000 of the project costs. The budget includes \$24,000 to fund the district manager position; \$26,000 for accounting, legal, secretarial, and supplies; \$35,000 for engineering (facility planning and preliminary engineering which has been completed); \$11,000 for field testing of septic systems; and \$44,000 for the MBMG groundwater study.

ENVIRONMENTAL ASSESSMENT:

The limnology study documents rapid deterioration of the lake. If the problem is not addressed, the quality of the water in the lake may pose a health hazard throughout the area and contribute to a deterioration of all aspects of the environment.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$35,000 to cover the cost of preliminary engineering and facility planning. Previous work shows that a solution to the problem of sewage entering Whitefish Lake will be achieved through securing an EPA Construction Grant.

In no case shall the total amount of Water Development Program grant funds for the preliminary engineering and facility planning in the 1985-1986 and the 1987-1988 bienniums exceed \$35,000.

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| <u>APPLICANT NAME:</u> | Private Corporation |
| <u>PROJECT/ACTIVITY NAME:</u> | Nilan Canal Lining |
| <u>AMOUNT REQUESTED:</u> | \$25,000 Grant; \$75,720 Loan; \$100,720 Total |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$100,720 |

PROJECT DESCRIPTION:

The Nilan Storage Project, located seven miles west of Augusta, was constructed during 1950 and 1951 by the State Water Conservation Board to provide irrigation water storage. Nilan Reservoir is an off-stream reservoir created by two dams and has a capacity of 10,000 acre-feet. It is supplied by a canal from Smith Creek to Ford Creek and from Ford Creek to the reservoir. The outlet consists of canals to Smith Creek and Willow Creek from the east dam and north dam, respectively. The project is managed by a private corporation from Augusta.

It is estimated that 35 to 40% of the water from the east outlet canal is lost due to seepage through gravelly soils. This loss occurs at three locations in the canal. Lining these three sections will increase the water delivered to Smith Creek from 5,000 acre-feet to 7,000 acre-feet in any year that the reservoir is full. The applicant proposes lining these three sections with shotcrete and using the

increase in available water to help fulfill the water purchase contracts held by members of the association. These contracts are presently not being fulfilled.

TECHNICAL ASSESSMENT:

The alternatives investigated include raising the two dams five feet; raising the two dams 10 feet, or lining three sections of the canal with plastic, bentonite, or shotcrete. It was decided that raising the dams was too costly and that plastic and bentonite liners are only slightly more cost-effective and not as durable as shotcrete. Based on this analysis it was decided that lining the ditch with shotcrete was the best alternative. The three seepage locations were identified by field inspections and seepage volumes were estimated by instream flow measurements across each seepage section. Based on discussions with the applicant and associated engineers it is reasonable to accept their professional judgment regarding the benefits and costs; however, the analysis presented is preliminary in nature and there is some uncertainty associated with the figures presented.

FINANCIAL ASSESSMENT:

The total cost of this project is \$100,720 and will raise operation maintenance and charges from approximately \$2.70 per acre-foot to \$3.70 per acre-foot. The collateral available to secure the loan may not be adequate and must be approved prior to funding this project. The loan request will be considered under DNRC's private loan program.

ENVIRONMENTAL ASSESSMENT:

There are no known adverse long-term environmental impacts. There will be a minor short-term environmental disturbance during construction.

RECOMMENDATION AND CONTINGENCIES:

A grant equal to 25% of the project cost up to \$25,000 is recommended contingent on DNRC approval of the project scope of work and budget. In addition, the DNRC will reduce the Water Development Program grant total by any grant amount the applicant may receive from other DNRC grants.

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| <u>APPLICANT NAME:</u> | Private Individual |
| <u>PROJECT/ACTIVITY NAME:</u> | Gravity Sprinkler Irrigation System |
| <u>AMOUNT REQUESTED:</u> | \$11,150 Grant; \$15,590 Loan; \$26,740 Total |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Agricultural Stabilization and Conservation Service (ASCS) - \$17,500 |
| <u>TOTAL PROJECT COST:</u> | \$44,600 |

PROJECT DESCRIPTION:

The proposed project will convert 110 acres of flood irrigated hay to gravity sprinkler irrigated hay. The project area is located in Stillwater County 30 miles southwest of Columbus. Field slopes range from 4 to 15%. Surface runoff is medium to rapid, making it difficult to flood irrigate efficiently, and resulting in excessive water consumption and some erosion.

Under this project water will be diverted from a private ditch into an 8-inch-diameter pipeline and delivered to a big gun sprinkler. Irrigation efficiency is estimated to improve from 20% to 70%, conserving 72% of the water presently consumed.

This project will increase flows, improve water quality, and enhance the fishery in Fishtail Creek, a tributary of the Stillwater River. In addition, the project will conserve soil, reduce on-farm operation and maintenance costs, and improve crop production.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) reviewed several alternatives and performed a preliminary design of the selected alternative. The analysis performed by the SCS is adequate and the project is technically feasible.

The Stillwater River Preliminary Temporary Decree has been issued and there are no objections filed with the claims associated with this project.

FINANCIAL ASSESSMENT:

The total project cost is \$44,600 for materials, labor, and equipment. Engineering costs are not included, as the SCS will perform the final design at no cost to the applicant. The applicant will finance the project through the ASCS cost share program, this DNRC grant, and a DNRC private loan.

The project cost figures presented in the preliminary design are reasonable and are consistent with like projects and available unit cost data. However, given the preliminary nature of the design, there is some uncertainty associated with the costs, and they will be reviewed prior to releasing grant funds.

ENVIRONMENTAL ASSESSMENT:

There are no known long-term adverse environmental impacts associated with this project; however, there will be some short-term environmental disturbance during construction.

This project will increase flows, improve water quality, and enhance the fishery in Fishtail Creek as well as conserving soils in the project area.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$11,150 is recommended contingent on DNRC approval of the project scope of work and budget. This project will also be considered for residual funding under the DNRC private loan program.

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| <u>APPLICANT NAME:</u> | Town of Wibaux |
| <u>PROJECT/ACTIVITY NAME:</u> | Water Storage Reservoir and Distribution System Improvements |
| <u>AMOUNT REQUESTED:</u> | \$95,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Economic Development Administration (EDA) Grant - \$285,000 |
| <u>TOTAL PROJECT COST:</u> | \$380,000 |

PROJECT DESCRIPTION:

The Town of Wibaux is located on the eastern edge of Montana approximately eight miles from the North Dakota border. The town's water works system consists of a 100,000-gallon elevated storage tank and a water distribution system with 4-inch, 6-inch, and 8-inch cast iron mains. Water is supplied by two wells pumping a total of 330 gallons per minute (gpm). The supply is adequate, although a high sodium content occasionally occurs. The water works system has components, including the elevated storage tank, that are over 60 years old. The storage reservoir currently leaks and does not have a large enough storage volume to provide adequate fire protection. The water distribution system has many dead end mains, and some areas of town are only served by one water main. In addition, frequent breaks and slow leakage from the deteriorated mains occurs and greatly increases the possibility of contamination of the town's drinking water supply.

The project improvements that would be funded by this grant will consist of constructing a 300,000-gallon overhead water storage tank, which will give the town an adequate supply of stored water for both domestic use and fire protection. Improvements will also be made to the water distribution system by replacing the old and undersized water mains with 6-inch, 8-inch, and 10-inch PVC pipe and "looping" the system.

TECHNICAL ASSESSMENT:

The Town of Wibaux had a detailed water system analysis done in 1982 which evaluated the current water works system, the deficiencies, and priorities for improving the deficiencies. In 1985 a consulting engineering firm was hired to review the report and put together a cost estimate to construct the major items outlined. The town has a definite need for the improvements proposed. The project appears to be technically feasible and should solve Wibaux's problems.

The design will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences prior to commencement of construction. The WQB agrees with the general concept of the project.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$380,000 of which \$316,000 is for construction and contingencies, and the balance is for engineering, legal, and administration. The application is for a grant of \$95,000 and the remaining \$285,000 of funds are being requested from the EDA. The estimated project costs appear to be realistic and reasonable, and the most cost-effective means for improvement.

ENVIRONMENTAL ASSESSMENT:

Other than those short-term impacts typically associated with municipal construction projects, no adverse impacts are anticipated with this project.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project costs up to a maximum of \$50,000 and a loan for the remaining \$45,000 is recommended subject to the provision of other funds required to assure project completion. DNRC must also approve the project scope of work and budget.

If grant funding is not available for this project, Wibaux may request a loan for \$95,000.

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| <u>APPLICANT NAME:</u> | Toole County Conservation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Satellite Groundwater Data Network |
| <u>AMOUNT REQUESTED:</u> | \$97,420 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Montana Bureau of Mines and Geology (MBMG) - \$17,980 |
| <u>TOTAL PROJECT COST:</u> | \$115,400 |

PROJECT DESCRIPTION:

With the addition in 1986 of a computer for storage and retrieval, the Groundwater Information Center (GWIC), managed by the Montana Bureau of Mines and Geology (MBMG), is adding and compiling data from new sources and increasing substantially in size. The growth in database size and sophistication has pointed out the need for information dissemination to local residents, where the demand for this data exists.

The MBMG, under contract with Toole County Conservation District, proposes to create and demonstrate a satellite microprocessor-based information network for dissemination of information "downloaded," or moved, from the GWIC to local groups or agencies. This network would use existing staff and equipment from local government agencies, conservation districts, and extension offices, who would directly extend this data to local residents at the local level.

The demonstration of a series of local databases would occur in five counties (Toole, Custer, Valley, Sheridan, and Lake). The databases will be managed cooperatively by local groups or agencies, in some cases working in conjunction with the Soil Conservation Service and the Cooperative Extension Service.

Under this project, mainframe software will be developed to download existing data from the GWIC mainframe, and to upload new data from the satellite county microcomputer network, and microcomputer software will be developed for local groups to manage, search, retrieve, print out, and plot selected

information on the local microprocessors. This software will be self-instructing and easy to use. Direct technical support will be provided to the individuals who maintain the local county databases, allowing them to independently manage their database, to make additions to it, to distribute and interpret the data, and to provide factual and helpful responses to local residents' questions.

Project results will include: a system for distribution and updating of downloaded GWIC data, technical support and seminars for participating local groups, and database management and applications.

If the demonstration is successful, the satellite network will be extended to any other counties or offices wishing to participate in the program.

TECHNICAL ASSESSMENT:

The proposed project is a good technical solution to disseminating groundwater information to the local populace of Montana. The use of IBM or IBM-compatible microcomputers for the satellite network is a sound decision. The IBM computer is the standard of the industry and most software is developed with this in mind. The use of five counties for demonstration purposes seems justifiable; however, reviewers question the actual demand for the increased access.

Using a cross section of counties with various differing needs will help ensure that all aspects of the software and data base are applicable to local needs, and will allow problems to be worked out of both the data distribution system and the software, before the system is extended to a wider audience.

FINANCIAL ASSESSMENT:

Of the \$115,400 total cost for this project, \$79,570 is for salaries of the project coordinator, hydrogeologist/programmer, programmer, and data technician. Administrative costs and phone charges total \$2,800, travel and per diem costs are \$8,000, computer costs are \$5,800, and indirect costs to the MBMG total \$19,230.

Future expansions of the satellite network to other counties should be possible at minimal cost because the software will already exist.

ENVIRONMENTAL ASSESSMENT:

There are no adverse environmental impacts associated with this project. Obtaining more information about local groundwater resources, and providing access locally to this information, should result in better water management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$78,190 is recommended contingent on DNRC approval of the project scope of work and budget. Also, the project must be phased from the beginning with the computer downloading and statewide promotion campaign being completed first to demonstrate if there is a large demand for the satellite network. If the demand exists, the remaining phases of the project will be funded. The project must be coordinated with the Natural Resource Information System.

The \$65,770 grant was derived by subtracting the \$19,230 of indirect costs charged by the MBMG from the \$85,000 grant request.

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| <u>APPLICANT NAME:</u> | Department of Natural Resources and Conservation Water Management Bureau and the Department of Military Affairs (DOMA) |
| <u>PROJECT/ACTIVITY NAME:</u> | State Drought Response/Mitigation Strategy |
| <u>AMOUNT REQUESTED:</u> | \$57,800 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Water Management Bureau (WMB) and DOMA In-kind Services - \$20,000 |
| <u>TOTAL PROJECT COST:</u> | \$77,800 |

PROJECT DESCRIPTION:

The purpose of this jointly-proposed project is to develop a statewide systematic method to monitor moisture conditions, assess actual and potential drought impacts, and take action to mitigate those impacts. Specifically, the project will:

1. create a system for the timely collection, analysis, and dissemination of information on moisture conditions on a continuing basis before and during drought responses;
2. identify specific measures that can be taken to mitigate drought impacts, who should take these measures, and under what conditions they should be taken;
3. establish specific criteria for a phased start-up and shut-down of monitoring, assessment, and response activities by government agencies during drought emergencies; and
4. organize the different units of government so that timely and systematic information flow is assured and responsibilities are defined.

The grant funds requested for this project would largely be used to hire a contractor. The contractor would work under the immediate supervision of an oversight committee composed of personnel from the WMB and DOMA. The contractor would be responsible for the following:

1. A critical review of the literature, including programs used in other states, to describe implementation possibilities.
2. An evaluation of implementation possibilities for use in Montana, taking into account the technical capabilities and legal authority of local, state, and federal government as well as the private sector.
3. The assignment of the responsibility for specific actions to cooperating units.
4. The identification of clear, authoritative "trigger" criteria that will indicate when to initiate those actions.
5. The identification of the need for statutory changes and funding to accomplish selected activities.

The project has been designed to help reduce the significant impacts that severe droughts can inflict on the state by assisting local and state government in reacting to pending drought conditions. The project would be carried out by the WMB and DOMA's Disaster and Emergency Services Division with the assistance of a Drought Response Advisory Council.

Overall project guidance will be provided by the Drought Response Advisory Council formed to help develop the scope of the investigation and to review the practicality and implementation needs of the proposed actions. The final work product will emerge as a written report by the Advisory Council which presents a set of recommendations to improve past state drought assessment and response efforts.

TECHNICAL ASSESSMENT:

This proposal lays out a framework through which the state's drought response could be improved. However, it may be that the objectives of the contractor's work are optimistically ideal but not necessarily realistic. Less emphasis should be placed on possible changes in statutes and more on accomplishing goals under present authority. It is a positive step to have the WMB and DOMA cooperatively working, with an Advisory Council, in developing an effective state and local government response to drought situations in Montana.

FINANCIAL ASSESSMENT:

The project is estimated to cost \$77,800. In-kind services provided by the WMB and DOMA will amount to \$20,000. The remaining \$57,800 is requested as a grant. Of the grant amount, \$49,400 is to be used for contractor costs and \$8,400 for Advisory Council meeting costs.

Some reviewers have expressed concern that the contractor costs may be high, and that more review of existing departmental authorities could be accomplished by the appropriate agencies represented on the Advisory Council.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from this study.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$30,000 is recommended contingent on DNRC approval of the project scope of work and budget. DNRC has concerns about the high cost of a senior level contractor as being premature and too costly. It is suggested that state executive agencies contribute to an in-house review of their specific responsibilities and authorities when addressing statewide or regional drought response measures.

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APPLICANT NAME: City of Libby
PROJECT/ACTIVITY NAME: Master Water Plan
AMOUNT REQUESTED: \$52,670 Grant
OTHER FUNDING SOURCES AND AMOUNTS: None
TOTAL PROJECT COST: \$52,670

PROJECT DESCRIPTION:

Libby is a city of 2,744 people located in northwestern Montana in Lincoln County. The city's water system serves approximately 1,800 customers, with 1,000 located in the city and the remaining 800 within the immediate area. The existing water system consists of an unfiltered surface water supply from Flower Creek collected in an 80-million-gallon storage reservoir. The water then flows to a lower diversion dam storing nine million gallons and eventually into a covered baffled reservoir. A 24-inch pipe carries the water approximately one mile to a chlorination unit in town. The water is then stored in a 500,000-gallon elevated storage tank and delivered to customers.

In January of 1986 the City purchased the water system from the Pacific Power and Light Company along with the three associated water rights. The water system has some undersized mains, and some mains are buried above the frost line. The Department of Health and Environmental Sciences (DHES) issued a boil advisory for about 100 customers in one area of the city because of a chlorine detention problem.

This project will develop a master water plan to evaluate the present water system and needs for future development, and to establish a plan for development of the water system to serve population growth in the future. The specific objective is to provide information and data needed to operate and manage the water system in the most effective manner possible.

TECHNICAL ASSESSMENT:

The master water plan will provide information necessary for the city to evaluate any deficiencies in the present water system and the alternatives available for making improvements. Improvements and the associated costs will be ranked so that an orderly development of the system can occur.

Past history and work previously conducted on the Libby water system is very sketchy. It would be valuable for the city to develop a long-range plan, especially since the system was recently purchased. A master water plan seems to be the best way for the city to develop a good handle on the water system, and the supply and treatment capability.

FINANCIAL ASSESSMENT:

The cost of the project is \$52,670, for which the grant was requested. Engineering costs account for \$45,000, administration \$4,500, and \$2,970 is budgeted for inflation contingency. The project cost was estimated using the cost of a similar study for a town of similar size, adding a 10% administrative cost, and 6% inflation contingency.

ENVIRONMENTAL ASSESSMENT:

No negative environmental impacts will be associated with this master water plan.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$25,000 is recommended contingent upon DNRC approval of the project scope of work and budget. The grant amount disbursed will be dependent upon the engineer's cost estimate and on Libby securing additional funds if the costs are greater than \$25,000. Libby must go through a Request-For-Proposal process to select their project engineer.

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APPLICANT NAME: City of Miles City

PROJECT/ACTIVITY NAME: Spotted Eagle Lake Enlargement

AMOUNT REQUESTED: \$83,500 Grant

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$83,500

PROJECT DESCRIPTION:

Spotted Eagle Park is a 123-acre recreation area located southwest of Miles City on the west side of the Tongue River. The funds requested will be used to enlarge a 23-acre lake located in the park to 33 acres. The enlargement of the lake will provide for better and safer water-based recreation; the facilities are now overcrowded, poorly designed, and contain potential hazards to their many users. Several accidents, including two drownings, have been caused by congestion and the proximity of a mixture of uses including boating, fishing, and swimming. With the planned expansion of the lake, conflicting uses of the lake will be separated and isolated into specific areas to reduce the potential dangers.

The lake is an old gravel excavation site used by the Montana Department of Highways. It fell under jurisdiction of the City-County Recreation Department in the mid-1970s. Bureau of Outdoor Recreation funds were used to develop the recreation area. A variety of water sources used to augment the apparent artesian flow of water into the lake include excess water from the State Fish Hatchery, excess irrigation water from Fort Keogh Agricultural Research Station, and water pumped from the Tongue River.

TECHNICAL ASSESSMENT:

Lake expansion plans call for the excavation of an old river channel to allow for boat docking and speed-controlled entry to and from the lake. An area on the south side will be excavated to provide for a separate swimming and wading area. The Department of Fish, Wildlife and Parks (DFWP) believes the proposed expansion will significantly improve the existing fisheries.

FINANCIAL ASSESSMENT:

The city requests a grant for 100% of the total project cost. All costs were presented as estimates from local contractors. Excavation costs total \$75,000, and the concrete boat ramp is estimated to cost \$3,500. Sand hauled to the site will cost \$5,000. City personnel and equipment will be used in conjunction with or in addition to contract labor where possible.

ENVIRONMENTAL ASSESSMENT:

The lake will be drained before construction work begins; therefore, any impact to water quality will be eliminated. Long-term impacts will be positive through the improvement of the northern pike fishery by the creation of spawning areas.

RECOMMENDATION AND CONTINGENCIES:

A grant of 75% of the total project cost up to a maximum of \$62,625 is recommended contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Private Company

PROJECT/ACTIVITY NAME: People's Creek Rehabilitation

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Private Company - \$12,500 (In-kind)

TOTAL PROJECT COST: \$112,500

PROJECT DESCRIPTION:

The applicant proposes to rehabilitate portions of a 2,400-acre irrigation project located on the Fort Belknap Indian Reservation near Hays, Montana.

The project diverts water from Little Peoples Creek and has the potential to serve up to 20 water users. It was constructed in 1895 and was operated by the federal government until 1961, when it was turned over to a private water users association. Because of the poor project condition, the association currently receives little benefit from the system.

The proposed rehabilitation includes reconstructing the diversion structure, installing 25 turnouts, lining 1,000 feet of canal, and repairing a head gate. These repairs will allow one irrigation application to approximately 1,000 acres. An additional \$250,000 in repairs is required to provide irrigation water to the 2,400 acres covered by the project. There does not appear to be enough water available at the diversion source to provide full-season irrigation to the entire project.

TECHNICAL ASSESSMENT:

A reconnaissance survey of the project was conducted by an engineer employed by the Fort Belknap tribal government. The results of that survey were not available at the time of this review.

The approach used to implement the repairs includes the use of basic materials and practices to allow construction by local forces. The applicant also intends to make the improvements maintenance-free, since the association does not include a regular maintenance program.

Any improvements funded under this program should first be assessed in a detailed rehabilitation feasibility study.

FINANCIAL ASSESSMENT:

The total project cost is \$112,500. The applicant requested a \$100,000 grant; this project is considered to have repayment capability, so the grant should be limited to 25% of the total project cost.

The project budget includes \$16,800 for professional services, \$32,028 for labor, \$14,513 for equipment, \$37,459 for materials, \$3,000 for unspecified construction costs, \$8,700 for contingencies, and \$12,500 for in-kind services. Further documentation of designs and costs is required before the budget can be verified.

The association currently collects no assessment fees from its water users. The applicant is uncertain of funding sources for the remaining project costs if only a 25% grant is awarded. They may pursue additional funding through the DNRC private loan program.

ENVIRONMENTAL ASSESSMENT:

Based on the information available, no significant negative long-term impacts are anticipated. Further assessments should be conducted when the project is designed.

The applicant indicated that the project will enhance groundwater recharge in an area where three wells run dry on a seasonal basis.

RECOMMENDATION AND CONTINGENCIES:

A 25% grant up to \$28,125 is recommended contingent on DNRC approval of the project scope of work and budget. Prior to initiating the project the applicant must conduct a feasibility level rehabilitation

study to demonstrate the required improvements, the priority of the improvements, and the costs and benefits associated with them. The applicant must also obtain DNRC approval of the plan for project administration before beginning the project.

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APPLICANT NAME: Town of Cascade

PROJECT/ACTIVITY NAME: Water Distribution and Supply System Improvements

AMOUNT REQUESTED: \$100,000 Grant; \$200,000 Loan

OTHER FUNDING SOURCES AND AMOUNTS: Local Revenue Bond - \$442,000; Community Development Block Grant (CDBG) - \$350,000

TOTAL PROJECT COST: \$1,092,000

PROJECT DESCRIPTION:

The Town of Cascade is a rural community of 773 people located along the Missouri River approximately 25 miles southwest of Great Falls. The town needs to replace a major portion of the water distribution system, which consists of cast iron water mains installed in 1915 that have deteriorated due to electrolysis. The water supply system also needs to be upgraded to provide a dependable quantity for domestic use and fire protection.

The water supply comes from a spring and a system of wells which combine and discharge into the town's twin 102,000-gallon concrete reservoirs. The discharge piping from some of the wells needs to be replaced. Chlorination facilities are present at the storage reservoirs, but the piping and valves are very old, and are deteriorating. Treated water from the reservoirs flows by gravity to the water distribution system in town. The 4-inch and 8-inch-diameter cast iron mains lose up to 62% of the total water supply through leakage. Four different types of fire hydrants are located throughout town; some are outdated and deteriorating.

The applicant proposes to replace the existing cast iron pipe mains with polyvinyl chloride (PVC) pipe to prevent electrolysis deterioration. The lines will be sized to provide adequate fire protection. New water valves will be installed at key locations. New fire hydrants will replace the outdated ones. Following the water distribution system improvements, the existing pavement or gravel street surfacing will be replaced. Deteriorated piping and valves at the storage reservoir and chlorine feed room will also be replaced. A second pump will be added to the spring box to increase supply, and one of the shallow wells will be redrilled.

TECHNICAL ASSESSMENT:

In 1985, Cascade hired a consulting engineering firm to evaluate the municipal water system, determine the areas of deficiencies, and develop cost estimates for the improvements needed to upgrade the system. The study was comprehensive and adequately addressed all areas of the water system. The need for improvements to the Town of Cascade's water distribution system is evident and the proposed project is appropriate, technically feasible, and will produce the desired effects.

The design of the proposed improvements will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences prior to beginning construction. Conceptually, the WQB agrees with the project proposal, and has ranked it high on a list of their priority projects.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated to be \$1,092,000, with \$955,800 for construction and contingencies and the balance for engineering, administration, and financing. The applicant requests a \$100,000 grant and \$200,000 loan from DNRC. The town will provide \$442,000 in local revenue bonds and will request a \$350,000 Community Development Block Grant (CDBG) to complete the funding.

The cost estimates appear realistic and reasonable, and it appears as though this is the most cost-effective alternative available. The town proposes to raise water rates by 12% to provide funds for line replacement. Current residential users rates are \$10.04 per user per month and are expected to increase to \$28.57 per user per month with the loans and grants requested.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with construction projects. Positive impacts will be associated with a more consistent water supply and a decreased fire hazard level.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$50,000 and a loan for \$150,000 is recommended contingent upon Cascade securing the remainder of project funding and passing the necessary bond issue if the DNRC loan is used. If grant funding is not available for this project the Town may request a loan of up to \$200,000. Any reduction in scope will result in a proportionately smaller grant and should not affect the priority improvements. If meters are cost-effective the town should look at installing them with this project. DNRC must also approve the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | Greenfields Irrigation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Willow Creek Measuring Device |
| <u>AMOUNT REQUESTED:</u> | \$2,074 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Greenfields Irrigation District - \$6,223 |
| <u>TOTAL PROJECT COST:</u> | \$8,297 |

PROJECT DESCRIPTION:

Greenfields Irrigation District, located near Fairfield, proposes to install a 12-foot-wide Parshall flume in the outlet channel below Willow Creek Reservoir. The flume is necessary for the accurate measurement of discharge water into the Sun River. Willow Creek Reservoir is an off-stream storage reservoir operated by the irrigation district serving irrigators on the Sun River. The entire operation of the Sun River irrigation system is dependent upon good water measurement at both Gibson and Willow Creek reservoirs. Adequate measurement is currently available only at Gibson.

TECHNICAL ASSESSMENT:

The measurement structure will be designed by the Greenfields Irrigation District's engineer. The structure will be constructed, operated, and maintained by the district.

The proposed measuring device will allow better management of stored water in the reservoir and will reduce "dewatering" effects in the Sun River. It is estimated that approximately 1,000 acre-feet of water can be conserved annually with the expected improved water management associated with improved water measurement.

FINANCIAL ASSESSMENT:

The total cost of installation of the Parshall flume is estimated at \$8,297. The Greenfields Irrigation District will administer the project and construct the flume using district personnel.

The district has an annual operating budget of about \$1.5 million. The budget includes a construction program which will fund 75% of this project. Revenue for district operations is generated by a \$14.54 per acre assessment to all users. The district is indebted by approximately 8.3 million dollars under a U.S. Bureau of Reclamation loan. Loan repayment capacity for the district constituents has been reached.

ENVIRONMENTAL ASSESSMENT:

Construction of the Parshall flume will cause short-term turbidity levels to be elevated. A construction permit allowing short-term exceedence of turbidity standards may be required by the Water Quality Bureau of the Department of Health and Environmental Sciences.

Anticipated long-term effects of better management by improved water measurement will be positive through reduction of de-watering episodes in the Sun River caused by misjudging the need for discharge from the reservoir.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to a maximum of \$2,074 is recommended contingent on DNRC approval of the project scope of work and budget.

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APPLICANT NAME: Mineral County

PROJECT/ACTIVITY NAME: St. Regis Community Park Irrigation & Beach Expansion

AMOUNT REQUESTED: \$49,127 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$49,127

PROJECT DESCRIPTION:

The northwestern Montana community of St. Regis proposes to improve its 13-acre community park by expanding the irrigation and drinking water system and improving the water quality and useability of an existing pond. Irrigation is presently limited to 2-1/2 acres of softball fields. Plans call for irrigation expansion to nine acres. The pond will be dredged to deepen it and debris will be removed. Part of the shoreline will be regraded to create a safe swimming area and improve areas for fishing. In addition, an aerator will be installed to maintain pond water quality through the summer. The pond is often affected by mid-summer algal blooms. This park provides the only available swimming area for the St. Regis community.

TECHNICAL ASSESSMENT:

The proposed improvements to the park appear to be reasonable and well presented. A landscape architect designed the plans, which have also been approved by the Soil Conservation Service (SCS). The Department of Fish, Wildlife and Parks (DFWP) supports the project.

FINANCIAL ASSESSMENT:

The requested \$49,127 grant would include \$1,400 for final design and supervision for the landscape architect/civil engineer, and \$47,727 for equipment and construction costs. The costs appear reasonable for the work described.

St. Regis has received a total of \$11,000 of Land and Water Conservation funds in the past from DFWP for previous park improvements.

ENVIRONMENTAL ASSESSMENT:

No long-term adverse environmental impacts will result from the project.

RECOMMENDATION AND CONTINGENCIES:

A grant of 75% of the total project cost up to a maximum of \$36,845 is recommended, contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Montana Bureau of Mines and Geology

PROJECT/ACTIVITY NAME: Investigation of Arsenic in Madison River Alluvial Groundwater

AMOUNT REQUESTED: \$29,129 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Montana Bureau of Mines and Geology (MBMG) - \$15,319

TOTAL PROJECT COST: \$44,448

PROJECT DESCRIPTION:

The presence of excessive arsenic levels in groundwater from the shallow aquifers of the Madison Valley was detected during a project undertaken to locate a safe municipal groundwater source for Three Forks in 1983. Water samples collected in the summer of 1984 from wells in the Madison Valley from Beartrap Canyon north to Three Forks contained arsenic concentrations greater than the Environmental Protection Agency's (EPA) maximum permissible concentration of 50 micrograms per liter for human consumption. This is believed to be a natural phenomenon, resulting from geothermal activity in Yellowstone National Park.

The MBMG proposes to sample wells along the Madison River to delineate the area, from Yellowstone Park to the Missouri River, where shallow wells produce water with arsenic concentrations above EPA's permissible concentration, and to analyze the data and construct a model to test the premise that the highest arsenic concentrations are found near the base of the alluvium.

During the second phase of the project the MBMG will conduct a limited drilling, sampling, and testing program in one of the areas of highest arsenic concentration, and attempt to define the immediate source of the arsenic (locally leached from sediments or transported in dissolved form).

Work will be performed by MBMG personnel. Final results, in the form of maps and reports, will be made available to county planning boards reviewing subdivision proposals, local citizens, the State Health Department, Department of Natural Resources and Conservation (DNRC), Environmental Protection Agency (EPA), United States Geological Survey (USGS), Soil Conservation Service (SCS), and local well drillers and landowners.

TECHNICAL ASSESSMENT:

The selected methods of determining the extent and source of arsenic levels appear to be the most technically feasible and cost-effective alternatives. Clearly defining the contaminated zone will reduce or prevent additional health risks within the area. The Phase II study may find aquifer zones with water of lower arsenic content which would be a viable alternative for persons now living in the contaminated aquifer area. The major value, however, should be to provide the type of information that planners need for zoning that would permit proper and safe development in this potentially hazardous area.

This groundwater study will provide complementary data which will supplement recent U.S. Geological Survey surface water loading calculations for arsenic in the Missouri River and its headwaters.

FINANCIAL ASSESSMENT:

The total cost of this project is \$44,448, with the MBMG providing \$15,319 for salaries and overhead, and the grant providing \$29,129. Of the \$29,129, \$7,845 is for salaries, \$2,435 for travel, \$9,000 for drilling, and \$3,509 for analytical costs. Supplies and publication costs total \$1,488, indirect costs to the MBMG total \$2,354, and inflation and contingencies total \$2,498. Cost estimates appear very reasonable and adequate.

Neither Madison County nor Gallatin County are contributing funds to the project.

ENVIRONMENTAL ASSESSMENT:

Without the information generated by this data, long-term adverse environmental health impacts could occur to those persons using groundwater sources high in arsenic. Information from this study could

prevent the development of these hazardous water supplies and would result in long-term positive environmental effects.

No long-term adverse environmental impacts will result from this project. Any adverse effects from well drilling and testing will be short-term and minimal.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$26,775 is recommended contingent on DNRC approval of the project scope of work and budget.

The \$26,775 figure was reached by subtracting the \$2,354 of indirect costs charged by the MBMG, from the \$29,129 grant request.

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APPLICANT NAME: Department of Natural Resources and Conservation - Energy Division
and Conservation Districts Division

PROJECT/ACTIVITY NAME: Energy Efficient Irrigation Workshops

AMOUNT REQUESTED: \$4,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Exxon Oil Overcharge Money - \$16,000

TOTAL PROJECT COST: \$20,000

PROJECT DESCRIPTION:

The applicants propose conducting five one-day workshops on irrigation energy efficiency in the irrigated areas of central and eastern Montana. Specific workshop locations are unknown at this time, but will be based on their ability to reach the maximum number of irrigators.

The purpose is to help irrigators reduce their consumption of energy and water during the irrigation season. In general, the topics to be covered include pump design basics, mainline sizing to reduce pressure, low pressure sprinkler heads, maintenance scheduling, water scheduling, gated pipe, and surge valves. Site specific information will be presented where appropriate by the local district conservationist, county extension agent, or other local expert. A specific project agenda or list of speakers has not yet been prepared. The applicants intend to solicit speakers through requests for qualifications, and will negotiate contracts with the selected speakers.

This activity will be coordinated with other agencies involved in irrigation efficiency such as the Montana Extension Service, Soil Conservation Service, Montana State University College of Agriculture and the Department of Agricultural Engineering.

To measure the effectiveness of the workshops, a follow-up survey will be conducted at the end of the irrigation season. Thirty to fifty irrigators are expected at each workshop.

TECHNICAL ASSESSMENT:

Energy costs as a percent of total costs on an irrigated farm vary from approximately 5 to 15%. The Bonneville Power Administration (BPA) estimates that by instituting operation and maintenance changes and increasing system efficiency those costs can be reduced by 10 to 50%. This means that implementing various energy efficient measures could reduce total farm budgets by 1 to 7%. In addition, the associated water management could reduce water consumption significantly. It is reasonable to expect that these savings can be achieved by implementing various energy-efficient measures and that education in these areas is worthwhile if it results in the implementation of conservation measures. The effectiveness of these workshops is an important consideration.

An assessment of the technical quality of this project cannot be made until a specific agenda is prepared and a list of speakers is developed. In general, the topics seem appropriate and the workshop planning seems adequate. Every effort must be made to coordinate with other agricultural agencies to ensure the information presented is consistent and that there is cooperation between agencies.

FINANCIAL ASSESSMENT:

The budget presented seems adequate and should cover all costs. The cost of speakers should be reduced by using experts in agencies that have goals and objectives consistent with those of the workshops, and may therefore be willing to share in this effort.

ENVIRONMENTAL ASSESSMENT:

This project will have no adverse environmental impacts. Water conservation and the associated reduction in runoff should make water more available to the public, enhance water quality, and conserve soil.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$4,000 is recommended contingent on DNRC's approval of the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | City of Red Lodge |
| <u>PROJECT/ACTIVITY NAME:</u> | Coal Miner's Park Irrigation and Revegetation |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | City of Red Lodge - \$4,100; In-kind Donations - Labor - \$35,000; Plants - \$8,000; Well - \$5,000 |
| <u>TOTAL PROJECT COST:</u> | \$152,100 |

PROJECT DESCRIPTION:

The City of Red Lodge is in the second phase of implementing the recommendations contained in a long-range master plan for the development of a city park, recreation complex, and zoo. Phase I of the plan was completed by the Department of State Lands when an abandoned coal waste dump and landfill site were reclaimed, re-topsoiled, and revegetated with suitable grass and forb species. The goals of this second phase call for the installation of an irrigation system and planting of woody plant materials (trees and shrubs) and turf grass in select areas. Upon completion of Phase II, the site will be used as a park. Further implementation of the master plan will occur as funding permits.

Under Phase II, several shallow wells producing less than 100 gallons per minute will be drilled. The water produced will be applied through an automatic sprinkler system to the 64-acre park.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) has designed the sprinkler system to accommodate two very limiting physical constraints:

1. The approximately four inches of topsoil placed over the coal gob has a water-holding capacity to store plant available moisture for only two days. Any excess water applied would be lost to the coal gob.
2. The area situated above the former landfill must not be irrigated too heavily; any excess irrigation water may infiltrate into the refuse of the landfill, causing problems, among which may be the production of methane gas. Also, since the site is adjacent to Rock Creek, any excess infiltration and leaching may carry contaminants to the creek, causing a degradation of groundwater.

Within these constraints of limited irrigation applications, the woody plant materials may not receive adequate moisture. A design incorporating bubblers or drip irrigation to the individual plants may be necessary. Also, special soil preparation for the trees is recommended.

FINANCIAL ASSESSMENT:

The cost of installing an automatic sprinkler irrigation system on the 64-acre park is high. Estimates for annual operating and maintenance costs were not supplied but may also be quite high. However, alternatives such as drip irrigation might be included, which may reduce costs and increase water use efficiency. There also may be less annual operation and maintenance costs with drip/trickle irrigation.

The Department of State Lands through its Abandoned Mine Reclamation funds has expended \$700,000 on this project to date under Phase I. The installation of the irrigation system under Phase II will help to ensure the success of the grass plantings and allow the establishment of woody plant materials. The automation of the irrigation system will greatly reduce otherwise high labor demands.

ENVIRONMENTAL ASSESSMENT:

The vegetative plantings will provide increased soil stability and enhance the aesthetics of the reclaimed area. Wildlife habitat improvement will be a benefit through the plantings of trees and shrubs.

The irrigation system will allow the establishment of the vegetation but water application must be closely monitored to avoid problems with the landfill and contamination of Rock Creek.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$100,000 unless Red Lodge receives Resource Indemnity Trust funding. Additionally, DNRC recommends a re-evaluation of the irrigation system design which may incorporate alternative irrigation systems for the woody plant materials, and limit automatic sprinklers to heavy use areas such as the ball park, zoo, and picnic areas. Due to the need to limit irrigation to light, frequent applications over the reclaimed coal dump, woody plants may not receive sufficient irrigation at their deeper rooting depths. A drip irrigation system, for example, may be more appropriate for the shrubs and trees.

Grant funds may be used for irrigation system design, if necessary. DNRC must approve the project scope of work and budget.

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APPLICANT NAME: University of Montana, Flathead Lake Biological Station

PROJECT/ACTIVITY NAME: Impacts of Shoreline Sewage Systems on Flathead Lake

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: University of Montana - \$7,400

TOTAL PROJECT COST: \$107,400

PROJECT DESCRIPTION:

The University of Montana Flathead Lake Biological Station (FLBS) proposes to determine locations along the Flathead Lake shoreline that receive nutrients from septic systems, to quantify the concentration of nutrients in shoreline groundwaters, and determine which proportion of those are from domestic sewage. The final project will be a detailed map of the lake indicating areas that show signs of septic leachate contamination, the extent of the contamination, and interpretations as to the effects of the additional nutrient loading. Data will also be used to refine the nutrient mass balance of Flathead Lake for research and lake modelling purposes. The final report will provide a synthesis of possible remedial steps that may be taken by landowners, county land use planners, and county shoreline protection boards.

TECHNICAL ASSESSMENT:

Through the Flathead River Basin Environmental Impact Statement (EIS), the International Joint Commission (IJC) reference on Cabin Creek, the Flathead Basin Commission, and various interagency monitoring programs, millions of dollars have been spent on studies of the Flathead Lake and River

system. However, very little is known about the contribution of nutrients from shoreline development, a potentially major influence on lake water quality.

The existing threat to Flathead Lake water quality underscores the need for this project. Degradation of Flathead Lake has been documented over the past decade and efforts are warranted to save this important recreational and economic resource. This study would complete the research picture and provide a basis for informed management decisions. The Freshwater Research Laboratory at FLBS is equipped and staffed for state-of-the-art work in limnology. The methodology for detection of septic leachates is well refined and has been successfully demonstrated on Whitefish Lake.

If this project is not funded, there will continue to be a lack of understanding of where septic leachates are entering Flathead Lake, their impact on localized algal growth and reduced water quality, and their role in the nutrient balance of the lake.

FINANCIAL ASSESSMENT:

Of the \$100,000 grant requested, \$40,159 is for salaries and benefits, \$40,394 is for chemical analysis, \$3,000 for travel, \$3,000 for equipment, \$1,400 for report publication, and \$12,047 in indirect costs to the University of Montana.

The project is economically feasible and appears to be properly budgeted. The potential benefits to the state and region greatly exceed the costs, especially because this project will draw from the considerable financial investment already made over the past decade to develop an understanding of the Flathead Lake system.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from this project. The data provided from this project could result in management decisions that have positive impacts to Flathead Lake.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$87,953 is recommended contingent on DNRC approval of the project scope of work and budget.

The \$87,953 figure was reached by subtracting the \$12,047 of indirect costs charged by the UM from the \$100,000 grant request.

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| <u>APPLICANT NAME:</u> | Greenfields Irrigation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Lateral Replacement |
| <u>AMOUNT REQUESTED:</u> | \$40,644 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Greenfields Irrigation District - \$121,930 |
| <u>TOTAL PROJECT COST:</u> | \$162,574 |

PROJECT DESCRIPTION:

The Greenfields Irrigation District proposes to rehabilitate 2.22 miles of open ditch located four miles north of Fairfield near Freezeout Lake. The objective of the project is two-fold: 1) to conserve water being lost through ditch seepage, thereby improving water delivery service to farms and 2) to replace 35 water control structures which have deteriorated.

The use of concrete ditch lining in conjunction with buried pipe will eliminate the need for 23 drop structures which require considerable maintenance. The system is expected to reduce seepage losses by five cubic feet per second (cfs) which amounts to annual water savings of 1,300 acre-feet. Water that is saved can be used to avoid crop stress in adjacent areas brought about by water shortages. The improvements are also expected to reduce recharge to nearby saline seep areas and to lower silt accumulations to the Freezeout Lake Game Management area.

TECHNICAL ASSESSMENT:

The existing canal lateral was constructed in 1935 and is in need of reconstruction. The proposed improvements are based on solid technology and are supported by many years of rehabilitation experience by the district.

Although the current maintenance costs associated with the open ditch were not documented in the application, the applicant indicated that several drop structures have failed in the past. The district should incur very low maintenance costs with the new system. The water conservation estimates also appear reasonable.

FINANCIAL ASSESSMENT:

The project budget includes \$16,111 for engineering and administration, \$26,630 for labor, \$26,630 for equipment, \$79,888 for materials, and \$13,315 for contingencies.

The district has an annual operating budget of about \$1.5 million dollars. Their annual assessments total \$14.54 per acre.

ENVIRONMENTAL ASSESSMENT:

Short-term impacts from the project will include increased erosion and sedimentation. The long-term impacts should be positive, with decreased sediment deposition in Freezeout Lake. Some wildlife habitat will be lost due to the canal lining and conversion to buried pipe.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$40,644 is recommended contingent on DNRC approval of the project scope of work and budget. The district is also required to obtain Department of Fish, Wildlife and Parks approval of the construction plan, since the work is expected to affect the Freezeout Lake Game Management Area.

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APPLICANT: Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY NAME: Ashley Lake Dam Rehabilitation

AMOUNT REQUESTED: \$31,500 Grant

OTHER FUNDING SOURCES
AND AMOUNTS:

None

TOTAL PROJECT COST: \$31,500

PROJECT DESCRIPTION:

Ashley Lake lies in a heavily timbered mountain basin, 23 miles northwest of Kalispell. The Department of Fish, Wildlife and Parks (DFWP) acquired the responsibility for the dam that formed the lake by decree of the Department of Natural Resources and Conservation (DNRC) and through a purchase agreement with the Ashley Irrigation District and other purchasers. Several farms, numerous culverts and bridges, three lakes, and the city of Kalispell are located downstream from the dam.

The dam structure was built about 1928 by the Ashley Irrigation District. The existing control structure is in such shape that the slide gate can only be operated with a hydraulic jack. Logs and debris typically clog the outlet, creating an unsafe condition, especially during times of high flows when waters could potentially overtop the structure. The DFWP proposes to replace the slide gate and build a trash rack.

A dam safety inspection conducted by DNRC in 1977 concluded that the dam was a high hazard structure. DNRC recommendations included additional study, building a trash rack, locking the controls, and removing logs and debris. At the time of the inspection they were unaware of the difficulty with the slide gate operation. The structure has apparently overtopped in the past with very little damage suffered, leading DNRC to conclude that the structure is basically sound.

TECHNICAL ASSESSMENT:

Considering the nature of the problem that exists at the Ashley Lake Dam, no other alternatives to the proposed project have been considered. Once funding has been obtained, DFWP will hire an engineering consultant to design the proposed improvements, and after review by the DNRC Engineering Bureau the project will be let for bids. Construction could be completed in the fall and winter of 1987 to coincide with the annual low water period. Upon project completion, the DFWP will continue to manage the structure for irrigation releases, and to maintain in-stream flow in Ashley Creek. The proposed project appears to be technically feasible and will produce the desired outcome of making the dam safer, and allowing for proper management of the water levels in the reservoir.

FINANCIAL ASSESSMENT:

As compiled by the Soil Conservation Service (SCS), the total project cost was estimated at \$35,000, of which \$27,500 is for construction and contingencies, and the remaining is for engineering, inspection, and testing. The DFWP is not charging for any time, travel, or other operation and maintenance expenses it incurs in administering the project. The estimated costs seem to be reasonable and cost-effective.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts resulting from this project are those minor, short-term impacts associated with construction when stream flows may be disrupted. Positive environmental impacts will result from better control of dam releases, improved dam safety, and flood control.

RECOMMENDATION AND CONTINGENCIES:

A grant up to \$31,500 is recommended contingent on DFWP acquiring a cost estimate for fabrication of the head gates and trash racks. DNRC must approve the project scope of work and budget. Any reduction in scope will result in a proportionately smaller grant and any reduction in scope should not affect the priority improvements.

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| <u>APPLICANT NAME:</u> | Sage Creek County Water District |
| <u>PROJECT/ACTIVITY NAME:</u> | Sage Creek County Water District Expansion |
| <u>AMOUNT REQUESTED:</u> | \$39,650 Grant; \$118,950 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COSTS:</u> | \$158,600 |

PROJECT DESCRIPTION:

The Sage Creek County Water District (SCCWD) currently serves 55 users in northeastern Liberty County and northwestern Hill County. The facility was completed in 1985 and includes a water supply developed from a groundwater source using an interception gallery and collector. The groundwater is piped to a chlorinating unit for disinfection and then distributed throughout the system network by gravity flow.

The proposed project will expand the District to provide potable water to another ten rural users, all of which are located immediately south of the existing district. These potential users now haul drinking water from either Chester or Joplin, with an average round trip distance of 40 to 50 miles.

The project will add approximately 25 miles of service line with gasket joints to the district's 96.2 miles of distribution piping. The new lines will be connected to the district's gravity system and will be placed within 200 feet of the new user residences. Individual users will be responsible for connecting to the District's line and installing cisterns or other water storage facilities.

TECHNICAL ASSESSMENT:

Alternatives such as expanding the existing water supply from wells and surface sources were investigated and rejected due to the poor water quality and the high cost of drilling deep wells.

Because of the nature of the project in the Sage Creek County Water District the most cost-effective method of providing water service to these additional households is a simple expansion of the existing system. Adequate water supply, chlorination facilities, and pressure reducing facilities to supply and service the additional users are present in the existing water distribution system.

The design for the expansion of the District's water distribution system will be reviewed and approved by the Water Quality Bureau (WQB) prior to starting construction. The WQB agrees that the proposed water distribution expansion will adequately deliver potable water to the 10 additional users. The proposed project is technically feasible and will produce the desired effects.

FINANCIAL ASSESSMENT:

The total project cost is estimated at \$158,600, of which \$132,000 is for construction and contingencies and the balance is for engineering and administration. The estimated costs seem reasonable and realistic and it appears that the most cost-effective alternative was selected.

The only source of funding identified for this project is the DNRC Water Development Loan and Grant Program. The district's current indebtedness is \$623,000 for its 1985 Water Development Loan to pay for the existing water supply and distribution system. The district requests that DNRC restructures the loan to ensure repayment ability. Current assessments average \$80 per user per month and if the water district is expanded by ten users an increase to \$97 per user per month would be required. Projected user rates of \$105 per user per month are anticipated by 1990. The Sage Creek County Water District appears to have the capability to repay a loan, but the user rates are at the same time becoming quite costly.

ENVIRONMENTAL ASSESSMENT:

The proposed project will have a positive effect on water quality for the new users served by the expanded system. Only temporary impacts on vegetation, soils, and wildlife are anticipated during the construction phase.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$39,650 and a loan for the remaining \$118,950 is recommended contingent upon the district completing the public notice steps required to expand the district and incur the additional debt. If grant funding is not available for this project the district may request a loan for the entire amount of the total project cost. DNRC must also approve the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | City of Shelby |
| <u>PROJECT/ACTIVITY NAME:</u> | Shelby Water Rehabilitation |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Shelby - \$9,246 |
| <u>TOTAL PROJECT COST:</u> | \$109,246 |

PROJECT DESCRIPTION:

The purpose of this proposed project is to rehabilitate the City of Shelby's water wells to improve operational efficiency. The water well field that supplies all of the water for Shelby is located approximately six miles south of Shelby in the Marias River Valley. The field has ten producing wells - the first drilled in 1940 and the last in the summer of 1985. Well depths range from 31 feet to 50 feet while well yields vary from 125 gallons per minute (gpm) to 330 gpm.

The rehabilitation effort consists of pulling the pumps on five of the old wells, inspecting the pumps, and rebuilding the impellers, shafts, bearings, casings, or screens as needed. These wells will also be cleaned and back flushed. Two other wells, which were drilled in 1975, will be developed using air and

chemical processes to reduce clogging. These two wells have never produced as anticipated and have been used sparingly as a result. The obsolete well control systems will be replaced with new radio-controlled systems to provide either manual or automatic capabilities for a more efficient operation of the well field.

TECHNICAL ASSESSMENT:

Drought conditions in the summer of 1983 caused very low water levels in the Marias River, resulting in the City of Shelby experiencing some difficulties in supplying the city's water demand. As a result the city hired an engineering firm in 1984 to conduct a "Water Supply Study for the City of Shelby, Montana" to identify alternatives for increasing water supply.

Upon review of the "Water Supply Study" the City decided to pull the pump on well #2 in 1985 and rehabilitate it, following the proposed plan. The production rate, according to the City, more than doubled. Similar results are expected with the proposed rehabilitation of the five wells identified.

With a reasonable river flow the rehabilitation effort will meet water demands of Shelby without having to provide a further expensive expansion of the well field. This pump rehabilitation effort seems to be a good approach to alleviate Shelby's water supply problems and appears to be technically feasible.

The improvements will be reviewed and approved by the Water Quality Bureau (WQB) prior to commencement of construction. The WQB agrees with the concept of the project and its need.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$109,246, with a grant providing \$100,000 and the City of Shelby contributing the remaining \$9,246. Professional services will account for \$63,596 of the costs, radio controls another \$23,500, and construction costs will account for the balance. The costs appear to be reasonable.

ENVIRONMENTAL ASSESSMENT:

Only short-term impacts are expected with a pump rehabilitation effort as proposed. Short-term water shortage may result.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the project cost up to \$25,000 and a loan for the remaining \$75,000 is recommended, contingent on Shelby passing the necessary bond issue for the loan repayment or securing the remaining project funds from other sources. If grant funding is not available for this project the City may request a loan for the entire amount of the total project costs. Any reduction in scope will result in a proportionately smaller grant and should not affect priority improvements. DNRC must also approve the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | Private Individual |
| <u>PROJECT/ACTIVITY NAME:</u> | Waterspreading Irrigation |
| <u>AMOUNT REQUESTED:</u> | \$11,600 Grant; \$19,345 Loan; \$30,945 Total |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Soil Conservation Service (SCS) - \$16,852 |
| <u>TOTAL PROJECT COST:</u> | \$47,797 |

PROJECT DESCRIPTION:

The applicant is proposing to install a series of small dikes to develop waterspreading irrigation on 52 acres. The project is located near Ismay, southeast of Terry, Montana.

The primary purpose of the project is to supply an increased hay base for a ranching operation. In the past five years, hay and pasture production has been very low. As a result, the applicant has been forced to purchase large amounts of hay. This irrigation project would help alleviate this situation.

The applicant indicates that the project will provide improved habitat for both game and non-game species in the area. The vegetation provided on the spreader dikes should offer a source of permanent cover and feed for wildlife if the area is not heavily grazed by livestock.

TECHNICAL ASSESSMENT:

Waterspreading is a cost-effective means of irrigation often used in southeastern Montana. The proposed project has been designed by the SCS according to their design standards. The SCS will provide construction inspection if the project is implemented.

The applicant intends to use a portion of the Little Beaver Conservation District's reserved water right for the project. The required permit has not yet been requested by the applicant. Such a request requires approval by the conservation district and the Board of Natural Resources and Conservation.

FINANCIAL ASSESSMENT:

The project budget includes \$20,928 for labor, \$16,000 for equipment, \$3,677 for materials, \$1,100 for stand establishment, \$3,670 for contingencies, and \$2,422 for inflation. The cost estimate includes \$5,000 for purchase of a five-cubic-yard scraper. The cost estimate also includes \$5,500 for pump equipment, which does not appear necessary for the project unless the acreage is expanded in the future.

The economic feasibility of this project has not been documented and appears very marginal. The SCS construction cost estimate, without contingencies, resulted in development costs of \$600 per acre. The applicant's total project budget, including contingencies and inflation, shows a development cost of \$919 per acre. The project should not be expected to provide positive returns at this high cost. However, the applicant will pay \$372 per acre if a 25% grant is approved through the Water Development Program and if the \$16,852 SCS grant is authorized. The project may be financially feasible to the applicant if the grant is approved.

ENVIRONMENTAL ASSESSMENT:

The project should provide some positive long-term impacts to wildlife habitat. A positive impact to O'Fallon Creek will include decreased flood flows, but negative impacts could be decreased water quality resulting from irrigation return flows.

RECOMMENDATION AND CONTINGENCIES:

The Department recommends a grant of 25% of the project cost up to \$9,324 contingent on DNRC approval of the project scope of work and budget. Grant funds shall not be used to purchase the five-cubic-yard scraper which was requested in the project budget. The applicant shall be further limited to the purchase of only one of the two high-capacity pumps using grant funds.

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| <u>APPLICANT NAME:</u> | Yellowstone County |
| <u>PROJECT/ACTIVITY NAME:</u> | Hillcrest Water Project |
| <u>AMOUNT REQUESTED:</u> | \$99,934 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$99,934 |

PROJECT DESCRIPTION:

The Hillcrest area is in a rural setting on the south bluffs of the Yellowstone River approximately six miles southwest of the Billings city limits. The project will be an extension of a water system presently serving two homes. A 6-inch water line will be extended approximately one mile and will fill a new 10,000-gallon storage reservoir. The reservoir will be located on a hill and will gravity feed the cisterns of six new users who presently haul domestic water, a new fire hydrant, and sanitary facilities at Hillcrest Natural Area (a 120-acre park) will also be served.

The project will provide a filling station for fire protection for ranches, farms, and homes in the area, as well as for the nature park. The six new users are along the water line extension route to the storage reservoir and will be connected and served by the system.

TECHNICAL ASSESSMENT:

The original water system was designed to provide water for about 35 homes, so the water source should be able to supply the proposed project. The original design, water gallery, and water quality have been previously reviewed and approved by the Water Quality Bureau of the Department of Health and Environmental Sciences.

The main purpose for the project is fire protection for the nature park and the homes, ranches, and farms in the area. Delivery of domestic water to the new users appears to be secondary. The project is technically feasible and should achieve its purpose.

FINANCIAL ASSESSMENT:

Total project costs are estimated at \$99,934, of which only \$1,000 has been reserved for engineering design review. The balance is for construction and contingencies.

Since the primary goal is to provide fire protection and the secondary goal is to provide domestic water, the project may be financially feasible, when relating the project costs to potential losses of farms, ranches, and homes in the area because of inadequate fire protection.

ENVIRONMENTAL ASSESSMENT:

Construction impacts should be limited to the typical short-term effects of waterline construction. No major adverse impacts are expected.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$25,000 is recommended contingent upon the applicant securing and documenting the other funding necessary to complete the project, and on DNRC approval of the project scope of work and budget. The remaining project funds may be secured through a DNRC loan if the proper legal entity is formed, and additional information is submitted to DNRC for review. If grant funding is not available for this project, Yellowstone County may request a loan for the full amount.

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| <u>APPLICANT NAME:</u> | Montana Bureau of Mines and Geology |
| <u>PROJECT/ACTIVITY NAME:</u> | Hydrogeologic Controls on Selenium Mobility Within Non-irrigated Areas |
| <u>AMOUNT REQUESTED:</u> | \$99,946 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Montana Bureau of Mines and Geology (MBMG) - \$29,001; United States Geological Survey (USGS) - \$56,376 |
| <u>TOTAL PROJECT COST:</u> | \$185,323 |

PROJECT DESCRIPTION:

During the mid-1970s, the MBMG was involved in dryland salinity investigations in the Hailstone and Wheat basins in northern Stillwater County. During these and current saline seep investigations, dissolved selenium was found up to 1800 parts per billion (ppb). (The drinking water standard is 10 ppb.) Limited water-quality sampling also showed elevated selenium concentrations at Benton Lakes near Great Falls, which are attributed to irrigation water return flows. The MBMG plans to document that an equally great potential for selenium toxicity exists from non-irrigated farm practices, and to demonstrate the relationship of land management techniques to the mobility of selenium. Of particular

concern within the Stillwater County project site is the ultimate impact on water quality of the lakes within the Halfbreed Lake and Hailstone National Wildlife refuges.

The project will determine: 1) the hydrogeochemical processes that result in the occurrence, mobilization, transport, and the probable fate of selenium in areas of saline seep occurrence; 2) the relationship of land-use practices to these processes; and 3) the biota uptake of selenium in native sod and in agricultural and aquatic plants.

This will be accomplished by describing the hydrogeologic system in the area and by conducting groundwater monitoring using the network of existing wells and lysimeters in the area. Some new monitoring sites will also be established. The physical and hydrogeochemical environments will also be described, and the biological uptake of selenium by various types of vegetation will be determined. Air will be monitored to determine movement of selenium by wind erosion.

Results of the project will be used to make land management decisions that will minimize or reduce the concentration of selenium in groundwater.

TECHNICAL ASSESSMENT:

The proposed study of selenium cycling in dry-land farm areas could provide new information about how this potentially toxic element is transported and concentrated due to irrigation practices. One of the main areas to look at is the potential accumulation of selenium in deep-rooting crops such as alfalfa, which is advocated for planting throughout the state where saline seep is a prevalent problem. The study would complement existing studies of saline seep, and help conserve the quality of groundwater resources. The U.S. Fish and Wildlife Service is currently studying this issue on a number of wildlife refuges nationwide. The two projects should be coordinated to avoid duplication.

Reviewers have indicated the proposal may be too broad, and that it is difficult to tell whether the findings on selenium concentrations and transport could be readily translatable into land management recommendations. The proposal lacks the detail needed to complete an assessment of the methodology; however, there is a need for the information this project could provide.

FINANCIAL ASSESSMENT:

Of the \$99,946 grant requested, \$45,312 is for salaries and benefits of a hydrogeologist, agricultural specialist, air quality specialist, clerk, and local observer. Travel and per diem costs total \$8,750, equipment and supplies total \$11,560, and analytical costs total \$24,600. Indirect costs to the MBMG add \$9,724 to the project cost. The MBMG will contribute \$24,001 mainly toward personnel costs, and the USGS will provide \$56,376 spread over all budget categories of the project. The total cost of the project is \$185,323. Reviews express concern that sampling and analysis costs may be too low to insure that the samples are statistically representative.

ENVIRONMENTAL ASSESSMENT:

The project should have beneficial environmental impacts if it results in recommendations that can be put into practice.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$90,222 is recommended contingent on DNRC's approval of the project scope of work and budget.

The applicant must demonstrate that the project is being coordinated with selenium studies and salinity work being conducted by the U.S. Fish and Wildlife Service and the Montana Salinity Control Association.

The \$90,222 figure was reached by subtracting the \$9,724 of indirect costs charged by the MBMG from the \$99,946 grant request.

APPLICANT NAME: Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY NAME: McNeil Slough Reconstruction

AMOUNT REQUESTED: \$45,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$45,000

PROJECT DESCRIPTION:

The Department of Fish, Wildlife and Parks (DFWP) proposes to investigate the feasibility of reconstructing an earthen impoundment on an old oxbow of the Milk River near Saco, Montana to enhance sport fishing and public recreation. The original dam, constructed in the mid-1940s, washed out in the spring of 1977 due to burrowing by muskrats or beaver. The project site is located north of Nelson Reservoir adjacent to the Milk River in Phillips County and is locally known as McNeil Slough.

The reservoir and surrounding area were once used for camping, fishing, and irrigating. The area served as a state fish hatchery and a livestock water supply, and also provided wetland wildlife habitat. The drainage area above the dam is approximately 220 acres. There is a great deal of public support to redevelop this recreation site.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) and Department of Natural Resources and Conservation Engineering Bureau investigated the site and agree that the feasibility of reconstructing a new dam should be evaluated. The original site, as well as an alternate site located approximately 200 feet upstream of the original site, should be investigated.

The feasibility study will include preparing preliminary field investigations, preliminary engineering assessment, an investigation of property rights to determine water supply and water rights ownership, and cost estimates for the proposed construction.

All technical questions relating to the dam site will be identified in the study report. The DNRC Engineering Bureau will help DFWP compose a scope of work for the project and help select an engineering firm.

FINANCIAL ASSESSMENT:

The total project cost is estimated at \$45,000, of which \$20,000 is for engineering and preliminary design, \$15,000 is for aerial photos and photogrammetric mapping (to produce topographical maps), \$8,000 for geotechnical investigations, and \$2,000 for inflation contingency. The DFWP must also identify where construction funds will be obtained and how they will be repaid.

ENVIRONMENTAL ASSESSMENT:

If this preliminary design study determines that reconstruction is technically and economically feasible for McNeil Slough, then an environmental assessment will have to be prepared. However, at this phase there will be no adverse environmental impacts associated with this feasibility study.

RECOMMENDATION AND CONTINGENCIES:

A grant of 75% of the total project cost up to \$33,750 is recommended contingent on DFWP securing the other funds to complete the project. DNRC must also approve the project scope of work and budget. Any reduction in scope will result in a proportionately smaller grant and should not affect the goals of the study.

APPLICANT NAME: Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY NAME: Streambank Preservation Program

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$100,000

PROJECT DESCRIPTION:

Under this proposal, grant funds would be awarded to the Department of Fish, Wildlife and Parks (DFWP) for operation of their Streambank Preservation Program. Under the program, matching funds up to \$5,000 would be awarded to individuals for projects that improve stream and streamside stability, maintain or improve fish and wildlife habitat and water quality, and prevent property damage. The projects would be identified through the department's enforcement of the Natural Streambed and Land Preservation Act of 1975.

TECHNICAL ASSESSMENT:

It is not possible to make a technical feasibility assessment because specific streambank preservation projects to be funded by this program have not yet been identified. However, in the area of streambank preservation, the DFWP does promote alternatives to older techniques such as riprap, by advising landowners to use vegetative stabilization and other innovative and less costly methods.

Not identifying specific projects gives the DFWP the flexibility to fund projects as their need and urgency arises.

FINANCIAL ASSESSMENT:

A \$100,000 grant is requested. The funds will be sub-granted to projects (\$5,000 maximum/each) at a 50% cost share with the individual. The DFWP will provide administrative in-kind services, but has not included direct funding for this program out of their department budget.

The DFWP Streambank Preservation Program received a \$100,000 grant in 1979 and a \$50,000 grant in 1983. The program was approved for a \$35,000 grant in 1985, but it is unlikely DFWP will receive those funds due to reduction in grant program revenues.

ENVIRONMENTAL ASSESSMENT:

Streambank stabilization problems left uncorrected can result in numerous adverse environmental effects such as destruction of fish and wildlife habitat, soil erosion, water quality sedimentation problems, property damage, and loss of recreational opportunities. Projects funded by this program would alleviate these problems in specific locations. Any short-term negative environmental impacts due to implementing the streambank preservation techniques would be greatly offset by the long-term positive aspects of the project.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$35,000 is recommended contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Anaconda-Deer Lodge County

PROJECT/ACTIVITY NAME: West Valley Flooding

AMOUNT REQUESTED: \$65,400 Grant

OTHER FUNDING SOURCES

AND AMOUNTS: Anaconda-Deer Lodge County (In-kind) - \$28,383; Resource Conservation and Development (RC&D) - \$64,600; Soil Conservation Service (SCS) (In-kind) - \$19,500

TOTAL PROJECT COST: \$177,883

PROJECT DESCRIPTION:

The Anaconda-Deer Lodge City-County government is seeking state and federal assistance to alleviate the flooding problems along Rumsey Creek. Rumsey Creek, which flows through the West Valley subdivision, has been altered by channel realignment from past agricultural activities, road construction, and a partially-breached dam. The West Valley subdivision is located three miles west of Anaconda and contains 36 homes.

Flooding from winter ice buildup, excessive spring runoff, and quick snowmelt have caused thousands of dollars in damages annually in the West Valley subdivision in seven out of the last 10 years. Flooding of individual septic systems has led to periodic contamination of domestic wells, causing the county sanitarian to advise West Valley subdivision residents to boil all drinking water. The Soil Conservation Service (SCS), working with the City-County government, has developed a plan agreeable to all parties to control the annual flooding.

TECHNICAL ASSESSMENT:

The SCS completed a preliminary feasibility study for the project and identified five alternatives to solve the flooding problems. Public meetings were held to select the preferred alternative.

The preferred alternative consists of a gated inlet system and pipeline sized to offer protection adequate for the 100-year rainfall event. A gated inlet would allow water to enter either into an 18-inch reinforced concrete pipe or go down a 24-inch corrugated metal pipe culvert to Rumsey Creek or both. To protect the subdivision from winter ice-up conditions from Rumsey Creek there will be provisions to divert Rumsey Creek to Warm Springs Creek through a 36-inch pipe which can convey the estimated maximum flow of Rumsey Creek. Two other 4-foot-diameter inlets teeing into the main 36-inch RCP pipeline are also needed to drain two low spots in the subdivision. The selected alternative appears technically feasible and should solve the problem.

FINANCIAL ASSESSMENT:

The SCS estimated the total project costs to be \$177,883. A grant of \$65,400 is requested to cover the estimated costs of materials and limited contract administrative costs. RC&D cost-share funds of \$64,600 will cover all construction and installation costs. SCS in-kind monies of \$19,500 will provide technical assistance for final design and construction inspection of the project. The city-county government's \$28,383 will provide in-kind services for some labor and installation costs. The selected alternative seems to provide the most cost-effective measure for controlling the flood events identified, and will eliminate the need to purchase land for rights-of-way or easements.

ENVIRONMENTAL ASSESSMENT:

Rumsey Creek is an intermittent stream that has been altered by man through channel realignment from past agricultural activities, road construction, and a partially-breached dam. Because of the intermittent nature of Rumsey Creek there are no aquatic, fishery, or wildlife resources of any significance. Once the project is completed, domestic water quality in the subdivision will be improved because the individual wells and septic systems will not be inundated with flood waters, thus eliminating a potential health hazard. The only adverse impacts that will result from this project are minor, short-term effects typically associated with construction activities.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$49,000, which is 75% of the grant amount requested, is recommended. Each landowner in the subdivision will be required to pay \$500 to make up the remaining grant amount. The grant is contingent upon securing the remaining project funding and on DNRC approval of the project scope of work and budget. Any reduction in scope will result in a proportionately smaller grant and should not affect the intent of the project.

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APPLICANT NAME: Montana State University

PROJECT/ACTIVITY NAME: Groundwater Exploration of the Bozeman Fan

AMOUNT REQUESTED: \$99,784 Grant

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$99,784

PROJECT DESCRIPTION:

Community growth in the Bozeman area of Gallatin County has created a potential water shortage which could impact the City of Bozeman, Montana State University, subdivision residents in the county, and the agricultural community. Groundwater development may help ameliorate the problem, particularly if it is coupled with floodwater recharge to prevent adverse surface water impacts and to improve sustained yield.

The Montana State University (MSU) Earth Sciences Department proposes to test the feasibility of groundwater development and to help direct future development by implementing a groundwater exploration program. This program will identify the location, extent, and characteristics of underground channels on and adjacent to the Bozeman fan through the use of seismic refraction. The work will be focused on those areas, identified on the basis of geomorphology, soil surveys, and geology, which appear to have the best chance of having substantial channels. Test well drilling and pumping results will be used to develop a model of the aquifer. A preliminary assessment of artificial floodwater recharge potential will be made. A final report will be produced and made available to city and county officials, MSU, developers, and agricultural interests. This information will help contribute to better planning and will maximize the potential to develop groundwater as a resource. The threat of future water shortages will be reduced.

TECHNICAL ASSESSMENT:

The problem of potential and real water shortage in the Gallatin Valley has been adequately documented. Groundwater probably cannot be looked at as the whole solution to the water shortage problem, but could contribute significantly to reduce the projected shortage of water while at the same time diversifying water use in the Gallatin Valley.

Refraction seismology is a widely recognized, cost-effective, and tested technology. Given the complex geology of the Bozeman fan, it appears to be the most appropriate methodology to use in this area. Well drilling and pumping will be contracted services, while all other work will be performed by MSU personnel.

While this proposal will assess quantity questions, water quality is not addressed.

FINANCIAL ASSESSMENT:

The total cost of this project is \$99,784 with this grant providing 100% funding. Local government entities are in support of this project, but have not committed to provide any funds.

Of the \$99,784, MSU indirect costs total \$10,344. Of the remainder, \$37,620 is for professional personnel, \$10,000 for equipment rental, \$37,720 for drilling and pumping, and \$4,100 for supplies, travel, phone, and printing. Cost estimates are well documented and appear reasonable and adequate.

ENVIRONMENTAL ASSESSMENT:

Without the development of additional water sources for the Bozeman area, adverse environmental impacts can occur from water shortages and depletion of surface water sources.

Negative environmental effects from test drilling and pumping will be minimal and short-term. Results of the proposed exploration could provide long-term positive environmental impacts by providing information to alleviate water shortages and promoting planning for future development.

RECOMMENDATION AND CONTINGENCIES:

A grant of \$44,720 is recommended contingent on the following:

1. Local funds (City of Bozeman, Gallatin County, MSU, other) must be contributed to match the \$44,720 grant.
2. The project must be coordinated with the Groundwater Information Center and the Natural Resource Information System.
3. DNRC must approve the project scope of work and budget.

The \$44,720 figure was reached by subtracting the \$10,344 of indirect costs charged by MSU from the \$99,784 grant request and dividing the \$89,440 remainder in half for the match requirement.

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APPLICANT NAME: Montana State University Agricultural Experiment Station

PROJECT/ACTIVITY NAME: Red Bluff Ranch Irrigation Project

AMOUNT REQUESTED: \$32,350 Grant; \$97,037 Loan; \$129,387 Total

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$129,387

PROJECT DESCRIPTION:

The Montana State University Agricultural Experiment Station (MAES) is proposing to convert 100 acres of flood irrigation to sprinkler irrigation and to install a new sprinkler irrigation system on an additional 100 acres. The project is located on the MAES Red Bluff Ranch east of Norris in Madison County.

The MAES now irrigates 100 acres of the project area, and produces approximately 150 tons of hay per year. The flood irrigation system is inefficient and labor intensive. The land topography is not well suited to flood irrigation, and as a result, erosion is a serious problem. The ranch must buy several hundred tons of hay each year for its operation. After the project is installed, MAES anticipates annual hay production of up to 1,000 tons. The project should pay for itself in five years.

TECHNICAL ASSESSMENT:

The proposed system includes installing two 75-horsepower pumps, a PVC mainline pipe, and two self-moving gun-type irrigators. This system selection is appropriate since the fields are irregular in shape and include various physical obstacles. The Soil Conservation Service (SCS) will act as project engineer.

A new water right permit may be required to convert the 100-acre dryland pasture to irrigation. Water availability should also be documented for the 200-acre project.

Students in farm and ranch management classes and in irrigation classes will receive educational value from their involvement in the operation of the irrigation system.

FINANCIAL ASSESSMENT:

The project budget includes \$2,000 for bond counsel, \$103,101.60 for materials, \$10,310.16 for construction contingency (10%), \$10,207.06 for inflation contingency (1-1/2 years @ 9%), and \$3,768.56 for financing costs. MAES will provide unquantified in-kind services as project administrator. No MAES

funds will be applied to the construction project directly.

Project revenues will exceed costs by \$16,300 per year assuming a 20-year, 7% loan on \$129,387. The hay produced will be used to meet the demands of the Red Bluff Ranch livestock, and excess hay will be marketed, with proceeds used for loan payments on the irrigation system. MAES funds previously budgeted for purchase of hay would be applied to other research activities.

ENVIRONMENTAL ASSESSMENT:

The long-term impacts on the 100-acre flood conversion should be positive because of decreased erosion and increased efficiency. However, the newly irrigated parcel will result in increased water consumption and irrigation return flows could possibly adversely affect the water quality of a nearby creek.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$32,350, and a Water Development loan of \$97,037 is recommended contingent on DNRC approval of the project scope of work and budget. The loan amount may be increased to \$129,387 if grant funds are unavailable.

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| <u>APPLICANT:</u> | Private Corporation |
| <u>PROJECT/ACTIVITY NAME:</u> | Greenhouse Development |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Private Investor - \$ 90,000; Applicant Funds - \$150,000 |
| <u>TOTAL PROJECT COST:</u> | \$500,000 |

PROJECT DESCRIPTION:

A private corporation proposes to construct a greenhouse operation to commercially produce high quality roses in Montana. The project site will be on twenty acres located near the Broadwater Hot Springs two miles west of Helena.

The rose growing facility will be a 204-foot-wide by 462-feet-long, 21-foot arched greenhouse with a capacity of 94,248 square feet all located under one roof. A two-pump system will deliver a minimum 400 gallons per minute (gpm) of hot water at 152[^{SUPER}]/[_{SUB}] F from a geothermal production well to the greenhouse. Tubes circulating the hot water throughout the greenhouse will provide the space heating and irrigation requirements. The hot water will reduce heating costs by more than 80 percent from what conventional sources (coal, gas, electricity) typically cost.

A source in California has agreed to supply 55,000 rose plants for initial production. First-year production at the new facility is expected to total 1,485,000 blooms generating gross receipts of \$1,113,750. It is anticipated that a tremendous market potential for cut flowers will continue to exist in the Northwest with an estimated one million roses sold each year to flower shops in Montana. No other year-round commercial growers exist in Montana or the Northwest. Twenty full-time employees will work year-round at the plant.

TECHNICAL ASSESSMENT:

The applicant owns the 20-acre parcel. A freshwater well on this parcel will supply the project's primary cold-water source. Construction supervision and equipment for the greenhouse will be supplied by a major contractor based in California.

The applicant has negotiated a 30-year lease for the geothermal well to supply the greenhouse. A two-pump system with one well pump lifting water to a small storage reservoir and a second pump capable of lifting 530 gpm of water at 152[^{SUPER}]/[_{SUB}] F 1,000 feet to the greenhouse for distribution has been designed. The location, greenhouse, pumps, wells, and distribution system seem to be

well-conceived and adequately designed. The project as proposed seems to be technically feasible and the cost estimates seem reasonable.

FINANCIAL ASSESSMENT:

Total project costs are estimated to be \$500,000, of which \$348,675 are for equipment and labor associated with the construction of the greenhouse. The remaining \$152,000 will fund the purchase of 55,000 bare-root rose plants needed for production. First-year production is estimated to total 1,485,000 blooms with an average annual wholesale price of \$.75 per bloom. Gross receipts for the proposed project are estimated to be \$1,113,750. The applicant has a financial backer who has committed \$90,000 to the project. The applicant is considering applying for a loan through the Water Development Private Loan Program.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with construction projects. The project is an environmentally clean, innovative new industry which will capitalize on an existing natural resource and energy source.

RECOMMENDATION AND CONTINGENCIES:

A grant of 10% of the total project cost up to \$50,000 is recommended contingent upon the applicant securing the remaining necessary funds. Verification of financial feasibility and the ability to repay any loans will have to be established before any grant money will be released. Any reduction in scope should result in a proportionately smaller grant and should not materially affect the project quality. DNRC must approve the project scope of work and budget.

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APPLICANT NAME: Blaine County Conservation District

PROJECT/ACTIVITY NAME: Turner Park Irrigation System

AMOUNT REQUESTED: \$22,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$22,500

PROJECT DESCRIPTION:

The northwestern Blaine County community of Turner proposes to replace an above-ground sprinkler irrigation system with a subsurface "leaky pipe" trickle irrigation system on 2.75 acres of its 8.75-acre town park. The conversion is intended to reduce water consumption, decrease pumping costs, and save labor.

Trickle irrigation will provide for a more favorable growing environment for grasses and woody vegetation, while conserving up to 50% of the water now lost through evapotranspiration. Other park activities include family picnics, club picnics, 4-H gatherings, overnight camping, and the annual fireman's picnic. Tourists traveling to Canada sometimes stay overnight at the park since the Port of Entry is not operated at night.

TECHNICAL ASSESSMENT:

"Leaky pipe" is a brand name of a drip/trickle irrigation company headquartered in Ft. Myers, Florida. Installation will be conducted by a private irrigation company from Havre, Montana.

Drip/trickle irrigation systems have a proven water savings capability of up to 50% or greater. The laterals of leaky pipe will be teed to a 3/4-inch buried mainline at 2-foot intervals. A two-year installation maintenance policy is included with a ten-year manufacturers' guarantee. Freezing is not a problem with the leaky pipe system due to its pliability if properly installed. Installation will require approximately two weeks.

FINANCIAL ASSESSMENT:

The bid of \$22,000 was obtained from a private leaky pipe irrigation company from Havre and includes all pipe, fittings, controls, and installation.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result because of this project. A decrease of 50% of the present water consumption rate will be a positive impact.

RECOMMENDATION AND CONTINGENCIES:

A grant of 50% of the total project cost up to \$11,000 is recommended contingent on DNRC approval of the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | University of Montana |
| <u>PROJECT ACTIVITY NAME:</u> | Wetland Filter Systems for Mine Effluent Treatment |
| <u>AMOUNT REQUESTED:</u> | \$81,732 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$81,732 |

PROJECT DESCRIPTION:

The University of Montana (UM) Forest and Conservation Experiment Station proposes to determine the effectiveness of native wetland vegetation communities in filtering toxic materials from surface or hardrock mine effluent. Implementation tasks include conducting a thorough literature review on the relationships of wetland vegetation and environmental factors to various levels of toxic pollutants, and then conducting an inventory of wetland communities in Montana which are currently receiving mine effluent.

A representative set of sites identified from the inventory will be sampled to document the quantity and composition of effluent discharge and species composition of the receiving wetland communities. From the representative sites three to five permanent monitoring sites in the native wetland filter systems will be selected. The efficiency of different wetland communities and individual species will then be evaluated through chemical analyses.

The results of the project will be summarized in the form of guidelines to aid land managers with reclamation and pollution abatement decisions and planning. Suggested design criteria for impoundment construction will also be established.

TECHNICAL ASSESSMENT:

The applicant claims that there is a limited understanding of the suitability of various wetland ecosystems for use as wetland filters. However, project reviewers comment that the technology has been successfully used for over ten years, and that the Montana Department of State Lands will be constructing two wetland filters in the summer of 1986, and will have three years worth of monitoring data by the time this proposal would receive funding. Extensive research is now being conducted nationwide on the use of wetland filters and it is possible there could be duplication of efforts with this proposal. Until the literature search is conducted by the applicant, the extent of duplication really won't be known. Project reviewers also had concerns about the value of the development of guidelines because of the number of variables to be considered at each individual site where wetland filters would be built. Reviewers also raised concerns that the applicant is not considering the impacts to groundwater from the use of wetland filter systems, or the potential effects of the pollutants on fish and wildlife that would be attracted to the wetland areas. Because specific sites are not selected, it is not possible to evaluate the adequacy of the monitoring and analyses proposed, nor to determine if the

applicant has the authorization to conduct the project on public or private lands. No other alternatives were identified.

FINANCIAL ASSESSMENT:

There are no other financial contributors to this project. Of the requested \$81,732 grant, \$43,610 is for salaries and benefits of the riparian ecologist, hydrologist/chemist and assistant. Travel and office supplies total \$6,500 and UM indirect charges total \$13,622. The remaining \$18,000 is for field supplies and chemical analyses. Because the specific sites have not been identified, it is not possible to assess if the analytical costs are adequate or excessive.

ENVIRONMENTAL ASSESSMENT:

Because no actual construction of wetland filters will take place, no adverse environmental impacts are expected to occur from the implementation of this project. Unless accurate analyses of the potential impact to groundwater and fish and wildlife are addressed in the guidelines generated from this project, adverse impacts could occur if a construction of a wetland filter takes place without these considerations.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$68,110 is recommended contingent on DNRC approval of the project scope of work and budget. The \$68,110 figure was derived by subtracting the \$13,622 of indirect costs charged by UM from the \$81,732 grant request.

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| <u>APPLICANT NAME:</u> | Private Individual |
| <u>PROJECT/ACTIVITY NAME:</u> | Buffalo Reservoir |
| <u>AMOUNT REQUESTED:</u> | \$11,375 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Private Individual - \$33,928 |
| <u>TOTAL PROJECT COST:</u> | \$45,305 |

PROJECT DESCRIPTION:

An individual who owns a family farm approximately nine miles northwest of Kalispell along Big Lost Creek proposes to develop a 10-acre storage reservoir to provide water year-round for six buffalo and the wildlife in the area. The water will be diverted from the Bowser-Tracy Ditch through a 12-inch inlet pipe. The reservoir level will stabilize with the natural flow entering the reservoir and exiting through the outlet pipe. Due to fluctuations in the Bowser-Tracy Ditch, use of a reservoir is the only way to insure that water will be available year round. The ditch now dries up in years of low precipitation.

A six-foot-high fence will be installed around the reservoir to restrict public access, because of potential danger from the buffalo. Native fish will be stocked in the reservoir, trees will be planted in the immediate area, and flotation devices will be installed on the reservoir for ducks, geese, and herons to use. Water rights for the 250 acre-feet of storage have been secured. Reservoir use will only be available to the owner and his family.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) has done some surveying and preliminary work on the dam and design. The reservoir will be excavated to a depth of 14 to 16 feet, and banks will be built around the reservoir three to four feet higher than the level of the ditch. This will allow the water to flow from the ditch into and out of the reservoir through inlet and outlet pipes complete with valves to regulate flow when necessary. Due to the permeability of the rocky soils in the area, a reservoir liner will be installed. Two types of liners are being considered. The first type is a very impervious material called

SS13 that is mixed with the soil and compacted on the bottom and sides of the reservoir. A 30- to 40-mil-thick liner typically used for hazardous waste ponds is the other type of liner being considered. The owner, who has some construction experience and equipment, will construct the reservoir with technical assistance from the SCS. The project appears to be technically feasible.

FINANCIAL ASSESSMENT:

Total project cost is estimated at \$45,305, of which the grant will provide \$11,375. The applicant proposes to pay for the remaining reservoir construction. Costs have not been documented well, and questions remain as to the actual costs of constructing the reservoir.

ENVIRONMENTAL ASSESSMENT:

The impacts associated with the project should only be those short-term ones typically associated with a construction project of this nature.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the total project cost up to \$11,325 is recommended by DNRC contingent on DNRC approval of the SCS design and the project scope of work and budget. The applicant must also document that full funding is available to complete the project before grant funds will be awarded.

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| <u>APPLICANT NAME:</u> | Montana Department of Fish, Wildlife and Parks |
| <u>PROJECT/ACTIVITY NAME:</u> | Gartside Dam |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant; \$465,000 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Department of Fish, Wildlife and Parks (DFWP) - \$35,000 |
| <u>TOTAL PROJECT COSTS:</u> | \$600,000 |

PROJECT DESCRIPTION:

Gartside Dam was an earthfill dam located on Crane Creek 10 miles southwest of Sidney in Richland County. The dam site is owned and operated by the Department of Fish, Wildlife and Parks (DFWP) and was used primarily for recreation. The embankment impounded 236 acre-feet of water with a surface area of 36 acres. The dam that existed at this site was breached in 1985 for safety reasons.

Gartside Dam was originally constructed by a local rancher around the turn of the century. The dam had been repaired and raised several times since. The U.S. Army Corps of Engineers identified major dam safety issues and questions in their November 1980 evaluation of the dam. In 1982, a large depression formed around the water outlet structure, causing major concern over the stability of the embankment. In early 1985, it was discovered that the outlet was clogged and the dam had to be breached as an emergency safety measure.

DFWP proposes to rehabilitate and reconstruct Gartside Dam in conformance with state and national safety standards to provide recreation opportunities for fishing, swimming, rafting, and other flat-water related activities. In 1983, an appropriation was obtained from the legislature to conduct feasibility and design studies.

TECHNICAL ASSESSMENT:

In the feasibility and design study completed in January of 1985, the project engineer considered several alternatives and in each case, the least expensive alternative was chosen. To safely impound the water and restore the dam, the project engineer has recommended that it will be necessary to: (1) replace the low level outlet works, (2) install a filter blanket on the downstream slope, (3) construct an earth berm on the downstream slope to provide dam stability, (4) provide beaching slope protection on the dam face to hinder erosion, and (5) rehabilitate and enlarge the principal spillway and line it with soil cement. These improvements will restore the dam to a safe condition and make it available for

recreational use once again. To accomplish these tasks, some land immediately downstream from the dam will have to be purchased. DFWP presently has an option on this property. DFWP has also proposed a plan to drill wells on a private owner's property upstream of the dam to monitor ground water levels. If the dam affects these levels, mitigation measures will be required.

The construction alternative recommended appears to be technically feasible and should satisfy the rehabilitation needs of Gartside Dam. The DNRC Engineering Bureau has worked closely with the project engineer on this study and concurs with the recommended alternative.

FINANCIAL ASSESSMENT:

Total project costs are estimated to be \$600,000 with construction costs and contingencies accounting for \$479,500 and with the remaining \$120,500 being for engineering, administration, financing, and legal review. DFWP requests a \$100,000 grant and a \$465,000 loan which they anticipate will have a 7% interest rate with repayment made in less than 20 years. Repayment funding will come from the DFWP fishing license revenues. DFWP plans to contribute \$35,000 of their own funds to this project. The project costs appear to be realistic and reasonable and it appears as though the most cost-effective alternative was chosen.

ENVIRONMENTAL ASSESSMENT:

The construction impacts associated with the dam rehabilitation and reconstruction will include: short-term decreased water quality to Crane Creek, lost vegetation in borrow areas and typical noise and dust associated with construction. Final impacts will be assessed and all permits acquired during the design phase. Twenty-six acres of hay and alfalfa land will be purchased by the DFWP and taken out of production due to the project.

Completion of the project will enhance recreation, and the fishery and wildlife habitat in the dam area.

RECOMMENDATION AND CONTINGENCIES:

The DNRC denies the grant request for this project and recommends that a non-subsidized Coal Severance Tax Bond loan for \$565,000 be awarded for the project. The groundwater problem must continue to be monitored and mitigated if necessary. If funds are available from the 1985 grant authorization for purchase of the land, then \$50,000 will be omitted from the loan authorization.

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| <u>APPLICANT NAME:</u> | Carter County |
| <u>PROJECT/ACTIVITY NAME:</u> | Little Beaver Creek Crossing on the Mizpah Road |
| <u>AMOUNT REQUESTED:</u> | \$42,064 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Carter County - \$9,261 |
| <u>TOTAL PROJECT COST:</u> | \$51,325 |

PROJECT DESCRIPTION:

The Mizpah road crosses Little Beaver Creek about five miles west of Ekalaka in Carter County. The creek crossing is a concrete slab poured in the bottom of the creek channel with all water passing over the concrete, and is referred to as a ford. During the spring snow melt, and when it rains, sometimes as late as June, the road is not passable at the crossing. The alternate route from Ekalaka to Miles City through Baker is 115 miles. There are no towns on the Mizpah road so farmers and ranchers either wait until the creek is passable or drive the longer route for necessities. Area children going to the Ekalaka school have to stay in town when the creek is impassable. The applicant proposes to install culverts at the crossing so the road can be passable year-long.

TECHNICAL ASSESSMENT:

Several design alternatives ranging from replacing the concrete "ford" slab to installing a bridge or culverts were discussed and evaluated. Due to costs and some site specific conditions, the preferred alternative for the creek crossing is to install precast concrete box culverts. Six five-foot by eight-foot culverts 24 feet in length will be necessary for this crossing. The design flow for this alternative was calculated and a recurrence interval between the 10- and 25-year flood was achieved, which is adequate for this class of road. The county will also evaluate the necessity for a guard rail. The project appears to be appropriate, technically feasible, and should solve the problem identified.

FINANCIAL ASSESSMENT:

The total cost of this project was estimated to be \$51,325. The applicant has requested a \$42,064 grant to cover the cost of project materials. Carter County will furnish the equipment and road crew necessary to haul in the required fill materials and furnish the labor necessary to complete installation of the project. The total contribution will total \$9,260 from general county revenues. The estimated costs appear to be realistic and reasonable and it appears as though the most cost-effective alternative was chosen.

ENVIRONMENTAL ASSESSMENT:

The project is estimated to take 10 working days to complete. Any adverse impacts to Little Beaver Creek resulting from this project should be minor, short-term effects typically associated with construction activities. Project construction will require approval of the Department of Fish, Wildlife and Parks under the Streambed Protection Act and a Section 3(a) authorization from the Department of Health and Environmental Sciences.

RECOMMENDATION AND CONTINGENCIES:

The primary purpose of this project is for the improvement of a county road. Since there are no direct water resource conservation measures or natural resource benefits associated with this project, DNRC recommends no funding.

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| <u>APPLICANT NAME:</u> | Private Individual |
| <u>PROJECT/ACTIVITY NAME:</u> | Water Development |
| <u>AMOUNT REQUESTED:</u> | \$16,070 Grant; \$48,209 Loan; \$64,279 Total |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$64,279 |
| <u>PROJECT DESCRIPTION:</u> | |

The applicant proposes to construct a dam to impound 50 acre-feet of water for domestic and recreational uses. The project is located on Coal Coulee approximately 11 miles north of Havre in Hill County.

The project will provide a domestic water supply for two farmsteads whose owners now must haul water from Havre. The domestic water system will require construction of a dam and installation of a pump and two miles of buried pipeline.

The facility will also provide recreational benefits, since the applicant intends to plant fish in the reservoir, and indicates that it will provide waterfowl habitat. However, details for public use of the facility have not been established, and the Department of Fish, Wildlife and Parks has not been contacted by the applicant regarding the proposed fishery.

TECHNICAL ASSESSMENT:

The Soil Conservation Service (SCS) has designed the dam and is prepared to provide construction inspection services. There has been no planning or design of the domestic water delivery system. The

cost of the pump, pipeline, and water treatment facilities were not included in the application. The SCS has indicated that they may be able to assist the applicant with design of the domestic water delivery system in the future.

If the water system costs were included in the application along with the cost of the dam, the total cost could exceed \$75,000. The resulting monthly water cost would be approximately \$340 per month per farmstead. A 25% grant would lower the cost to \$250 per month per farmstead.

A review of water supply options in the area resulted in identification of a North Havre Rural Water District (NHRWD) pipeline which is located 2-1/2 miles from the project. Discussions with a NHRWD representative indicate that both farmsteads could be served by the rural water system at the current system rates if they provide their own 2-1/2 mile pipeline hookup. This pipeline would cost about \$15,000, and the system rates are \$120 per month for 40,000 gallons of treated water. The approximate total monthly water cost for the NHRWD alternative is \$190 per month per farmstead.

FINANCIAL ASSESSMENT:

The project budget includes \$54,860 for construction, \$900 for surveying, \$100 for contract administration, \$2,575 for financing costs, and \$5,844 for contingencies. The total project cost was estimated at \$64,279 by the applicant. Additional water distribution and treatment costs could increase the cost to \$75,000.

A lower cost alternative to acquire domestic water is available through the North Havre Rural Water District.

ENVIRONMENTAL ASSESSMENT:

The proposed dam would be constructed on an intermittent stream. The small storage project is not expected to result in significant negative impacts to the environment. The project would provide some waterfowl habitat.

RECOMMENDATION AND CONTINGENCIES:

The Department recommends no funding for the proposed project because there is a more economical alternative available to obtain potable water for domestic purposes. The applicant should investigate the feasibility of connecting to the North Havre Water District system. A district representative has indicated that it could serve the applicant's water needs.

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| <u>APPLICANT NAME:</u> | Private Association |
| <u>PROJECT/ACTIVITY NAME:</u> | Goss, Schilling, Sidney Circle Central Sewer Project |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Farmers Home Administration (FmHA) - \$410,400 |
| <u>TOTAL PROJECT COST:</u> | \$510,400 |

PROJECT DESCRIPTION:

This proposed sewer project will serve the needs of a five-subdivision area, including the Goss, Schilling first and second additions, and the Sidney Circle One and Two Subdivisions all located about three miles southwest of Sidney, Montana. These rural subdivisions are provided water and sanitary services in the following manner: Goss and Schilling Subdivisions One and Two use individual wells and septic tanks and drainfields; Sidney Circle One uses septic tanks and drainfields and a central water system; and Sidney Circle Two is serviced by a central water system and a central sewer system drainfield. Six of the homes in the Sidney Circle One Subdivision have been hooked up to the central sewer system.

Several problems have been associated with the subdivisions, including house settling, septic system failure, cracked foundations, high nitrate and ammonia levels in some wells, road settling, and an

increased groundwater level. Richland County, at the request of the homeowners, recently contracted with an engineer to investigate the cause or causes of the problems. The investigation revealed that the cause of the problem was a result of a rise in the groundwater table. Recommendations included that all residences be hooked to a central water and sewer system, and the central sewer system was given the highest priority.

TECHNICAL ASSESSMENT:

The project includes a wastewater collection system and a wastewater treatment facility. The collection system will be a small diameter gravity sewer system using existing septic tanks to trap solids. Six-inch mains will be installed to maintain an acceptable velocity, with manholes every 400 feet, and cleanouts used on dead ends. The treatment system will be a complete retention lagoon with two evaporation ponds approximately 6.75 acres each.

Three wastewater treatment alternatives were identified. However, some additional alternatives may have been available. The system selected could involve additional continued maintenance through the pumping of the individual septic tanks, and the tanks could eventually develop leaks and further complicate the present problems.

In addition, the reviewers felt that other sources such as leaking water mains, subsurface infiltration from a nearby canal, and heavily irrigated fields in the area may also be contributing factors to the increased groundwater levels. Further groundwater monitoring is recommended. However, it was felt that a central sewer collection system and treatment facility instead of individual septic drainfields would alleviate some of the area's problems.

FINANCIAL ASSESSMENT:

Total project costs are estimated to be \$510,400, of which \$360,255 is the cost of construction and contingencies, \$92,400 is for hook-up costs, and the balance is for engineering, legal, and administration. The grant will provide \$100,000, and a FmHA loan will provide the balance.

The association will form a county water and sewer district and take over ownership of the existing central water and sewer facilities.

ENVIRONMENTAL ASSESSMENT:

Construction of this proposed project could alleviate some of the groundwater problems occurring in the area. Failed septic systems will be abandoned, groundwater contamination from these sources will stop, and groundwater levels may also decrease. If the septic drainfields are the cause of groundwater contamination, then water quality may also be improved.

The only adverse impacts associated with this project are those minor, short-term effects typically associated with utility construction projects.

RECOMMENDATION AND CONTINGENCIES:

Although the proposed project addresses one of the prime contributors to the groundwater problem, the reviewers felt that there was not enough information available to determine that the project will resolve all of the existing groundwater problems. Costs of the proposed project are quite high and it may not completely eliminate the groundwater problem. Therefore, DNRC recommends no funding for the central sewer project.

Monitoring of all potential groundwater contributors should be continued to determine the sensitivity of the soils to each potential groundwater input, and to identify and document a total solution to the problem.

APPLICANT NAME: Town of Lima, Montana

PROJECT/ACTIVITY NAME: Town Water System Reconstruction

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Town of Lima - \$150,000; CDBG Grant - \$400,000

TOTAL PROJECT COST: \$650,000

PROJECT DESCRIPTION:

Lima is a rural community of 260 people located in southwestern Montana approximately 15 miles north of the Idaho border. The water system that serves Lima consists of a spring, located three-quarters of a mile south of the community, and several thousand feet of gravity flow distribution lines. No storage facilities exist. Most of the distribution system is both undersized and deteriorated, and many of the lines are not looped. Water pressures are low throughout the system. Most of the distribution system needs to be replaced with 6-inch or larger pipe and looping of the lines is needed. In addition, both a storage reservoir to provide additional fire flow and a new larger transmission line into town are needed.

Lima proposes to design and construct the following system improvements: a 100,000-gallon storage reservoir located near the existing spring, 5,300 feet of 12-inch transmission line from the new storage reservoir into town, 15,250 feet of 12-inch, 8-inch, and 6-inch distribution line, 78 control (gate) valves, 24 fire hydrants with auxiliary valves, new service connections, and miscellaneous other improvements. They request grant funds for the construction of the 5,300-foot transmission line.

TECHNICAL ASSESSMENT:

In 1984, an engineering firm prepared "An Engineering Report for Improving the Domestic Water Facilities for the Town of Lima, Montana." This study was revised in 1985, evaluated the existing water system, and proposed appropriate solutions to deficiencies found. The proposed project will solve the problems with the present system. The alternatives selected appear to be appropriate, technically feasible, and should solve the town's problems.

The design for all proposed improvements will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences prior to beginning of construction. The WQB agrees with the project concept.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$650,000, of which \$566,000 are costs of construction and contingencies, and the balance is for engineering, financing, administration, and obtaining rights-of-way. The \$100,000 grant is for Phase II of the project, the construction of the 12-inch transmission main into town.

Lima has been awarded a Community Development Block Grant (CDBG) for \$400,000 and has received the first payment for the initial administrative costs. A raise in user water rates from \$5 per month to \$20 per month will be required to repay a DNRC Coal Severance Tax Loan approved by the 1985 Legislature. The estimated costs appear to be realistic and the most cost-effective alternatives appear to have been chosen.

ENVIRONMENTAL ASSESSMENT:

Only the usual short-term environmental impacts associated with this type of municipal utility construction are anticipated.

RECOMMENDATION AND CONTINGENCIES:

The 1985 Legislature authorized a \$376,500 Coal Severance Tax Bond Loan for this project. Lima has indicated that they will use \$150,000 of the loan authorization, and also requested a \$100,000 Water Development Program grant from this funding cycle.

The Water Development Loan and Grant Program limits grants for projects of this type to 25% of the total project costs up to \$50,000, with a total grant and loan combination of \$200,000. The town proposes to use \$250,000 of Department funds from two separate programs, which is contrary to Department policy. Because a Coal Severance Tax Bond loan is the appropriate funding mechanism for a project of this size, DNRC denies the grant request and recommends that the Coal Severance Tax Bond loan be reauthorized for \$250,000 at an interest rate two percentage points below the rate at which the state bond is sold for the first five years, and at the Coal Severance Tax Bond rate for the remaining 15 years. Any reduction in loan request will result in recalculation of the loan interest rate. The rate will be based on the annual water rates in relation to the median family income. Any reduction in scope should not affect priority improvements.

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APPLICANT NAME: Montana College of Mineral Science and Technology

PROJECT/ACTIVITY NAME: Computer Modeling of Mill Tailings Reclamation

AMOUNT REQUESTED: \$93,500 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$93,500

PROJECT DESCRIPTION:

This proposal is to develop a computer model which will be able to demonstrate the economic, environmental, and technical feasibility of reclaiming mine tailings to remove pollutants, while simultaneously recovering economically important minerals.

Because of recent fluctuations in both the supply and price of metal commodities, old mill tailings are considered as potentially recoverable metal sources. In many cases, these tailings have been deposited in locations where many contribute heavy metals, acidity, and pollutants to streams and groundwater systems.

A solution to this pollutant source may be the transport and relocation of the tailings during "re-mining" for recoverable metals. Since this is an untried venture for industry and government, there has been a hesitancy to undertake it. The computer model developed under this proposal will provide data for analyzing the environmental and financial benefits of joint government and industry mining and reclamation ventures.

TECHNICAL ASSESSMENT:

While the probability exists that industry and government will jointly rework and relocate old mill tailings, it appears that the computer model proposed for development would be of such a general nature that data generated would not be of much value.

The application also proposes to model site specific data from the McLaren Mill site near Cooke City. Until recently, the Department of State Lands (DSL) had the interest of a mining company to rework and relocate the tailings. An assay of the tailings was performed and economic feasibilities were conducted. The company was apparently interested until DSL was unable to obtain funding from the Office of Surface Mining for its portion of the reclamation work.

In summary, each potential joint venture will need to be assessed individually, and the general computer model proposed may not provide enough specific decision-making information.

FINANCIAL ASSESSMENT:

Of the \$93,500 grant request, \$57,000 will be for salaries of five professionals at two to three months each and \$26,500 will be for travel, laboratory testing, computer time, and technical support. The remainder of \$17,000 for University System indirect charges will be an in-kind contribution.

ENVIRONMENTAL ASSESSMENT:

The proposed study would result in no adverse environmental impact.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for this study. Based on reviewers' comments, the need for a general model is questionable because assays of mill tailings and reclamation plans must be developed on a site-specific basis.

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| <u>APPLICANT NAME:</u> | Montana Bureau of Mines and Geology |
| <u>PROJECT/ACTIVITY NAME:</u> | Amelioration of Brine and Hydrocarbon Leakage From Oil and Gas Exploration and Production Sites |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Montana Bureau of Mines and Geology (MBMG) - \$20,136 |
| <u>TOTAL PROJECT COST:</u> | \$120,136 |

PROJECT DESCRIPTION:

Recent problems in north central and eastern Montana related to salt water contamination of stock and domestic wells appear to be caused by hydrocarbon exploration and production. These problems can be caused by dumping of brine or by poor drilling or production practices. The MBMG proposes to conduct an intensive study of the hydrogeologic behavior of spilled oil field brine in the Williston Basin and to test the effectiveness of reclamation techniques intended to deal with brine and oil contamination of soils.

Project results will be data and modeling to provide guidelines necessary to aid state and federal agencies, private industry, and landowners in dealing with brine contamination problems.

The proposed study would use one research site in eastern Montana in the Williston Basin region to determine the basic water quality of the "lost" formation fluids, the rate of movement of the brine plumes, the dispersion and dilution effects by the shallow groundwater system, and the projected size of the plume by the time it is diluted enough for stock or human use, and how long it takes to reach those conditions. Lastly, the feasibility of soil reclamation techniques, and the time frame for revegetation will be evaluated.

TECHNICAL ASSESSMENT:

The proposal submitted would intensively investigate a limited contaminated area, rather than attempting large-scale rehabilitation. This is a sound approach, given the apparent lack of firm data on brine reclamation. Site-specific hydrogeologic data will not be directly indicative of contamination effects in other areas, but the soil and water sampling proposed should be intensive enough to identify processes that can be adapted to differing geologic conditions. Reclamation treatments on oil-contaminated land will be designed to accelerate microbial decomposition of soil hydrocarbons, possibly by increasing the soil temperature and moisture, improving aeration and nutrient availability, and adding microbes to the soil.

The goal of this effort is to determine if the reclamation techniques used will reclaim brine- or oil-contaminated soils; however, the proposal is technically vague as to how reclamation treatments will be tested and evaluated. Reviewers have indicated that while reclamation of soils that are already damaged is important, a focus on technologies that would prevent brines from escape in the first place is equally or more desirable.

FINANCIAL ASSESSMENT:

Of the \$100,000 grant requested, \$17,000 is for the salary and benefits of a hydrogeologist. Evaluation of surface contamination and reclamation techniques through work done by the Montana Salinity Control

Association will cost \$19,900. Analytical and drilling costs are \$41,500, travel costs are \$6,000, and student stipends and supplies total \$10,500. MBMG indirect charges add \$5,100 to the project. Costs appear reasonable and adequate, although more budget detail is needed for the reclamation technique evaluation portion of the project.

The Oil and Gas Division of DNRC has indicated that they do not have funds to allocate to these types of research proposals.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from this project. If the project results in the adoption of reclamation techniques or regulations to better treat or prevent brine contamination problems, the impact of this project could be very positive.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for this project because similar demonstration projects funded with Resource Indemnity Trust grant funds are being conducted in Toole County and in the Williston Basin. Results of these projects will likely be useful and incorporated into future projects. Also, the Environmental Quality Council is currently conducting an evaluation of oil and gas regulations.

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APPLICANT NAME: Montana State University

PROJECT/ACTIVITY NAME: Selenium in Stockwater in Relation to Mineral- Responsive Diseases

AMOUNT REQUESTED: \$74,616 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Montana State University (MSU) - \$39,103

TOTAL PROJECT COST: \$113,063

PROJECT DESCRIPTION:

The purpose of this project is to determine if there is a livestock selenium toxicity problem in Montana, and if so, to determine the extent of the problem, develop management guidelines to minimize the problem, and inform the public about the biological effects of selenium.

Existing literature and data relating to selenium and other trace mineral-responsive diseases on livestock operations will be summarized and assessed. Livestock producing regions will be surveyed through ranchers, veterinarians, and scientists to locate areas of potential trace mineral problems. The relationship of stockwater selenium and other trace minerals to forage and soil will be quantified, and water and forage samples will be collected and analyzed. Potentially hazardous forage and water samples will then be analyzed in laboratory trials using rats (and finally lambs). Maps will be developed showing locations where mineral problems occur. Least cost public service announcements and video films will be used to improve the public's understanding of the selenium and trace mineral situation and its importance in human nutrition.

TECHNICAL ASSESSMENT:

While the study proposal uses sound and proven research techniques, other alternatives to this study were not considered. Such alternatives could be to analyze the existing water samples stored by the MBMG for selenium determination. The study area could also be more defined by limiting surveys of ranchers and veterinarians to areas underlain by seleniferous geological materials. Information generated from the first phase of the proposal will determine if a selenium problem exists, where, and to what limited degree. This information is needed before it can be determined if the water, forage sampling, and laboratory animal experiment portions of the project are needed.

FINANCIAL ASSESSMENT:

Of the \$74,616 grant requested, \$23,740 will be for the salary and benefits of a technician. Laboratory analyses, animals, and equipment costs total \$21,435. Travel costs total \$8,500, computer analysis \$1,500, and publication of results \$10,000. Indirect charges from MSU total \$12,435. MSU will contribute \$13,000 for salaries, \$4,840 for laboratory analyses and animals, \$1,500 for communications, and \$19,763 in indirect costs. Until the initial determination of the extent of the selenium problem in Montana is made during the first phase of this project, it is not possible to know the extent of laboratory analysis or further investigation that will be needed. The budget presented assumed a significant problem would be identified and that over 1,000 samples would be needed, along with 500 lab mice, 12 lambs, and associated costs. If work done during the first phase indicates a less severe problem, costs should be reduced drastically.

Cost estimates for the capital purchases were obtained from laboratory supply catalogues and from farm and ranch supply outlets.

ENVIRONMENT ASSESSMENT:

No adverse environmental impacts will result from the implementation of this research project.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for this research project. The proposal could possibly duplicate work being conducted by the Fish and Wildlife Service, the Montana Bureau of Mines and Geology, and the U.S. Geological Survey. The major portion of the proposal is premature until the extent of the potential problem is defined.

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| <u>APPLICANT NAME:</u> | Cascade County |
| <u>PROJECT/ACTIVITY NAME:</u> | Gibson Flats Drainage Channel Renovation |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$100,000 |

PROJECT DESCRIPTION:

Gibson Flats is a 320-acre area located one mile southeast of Great Falls adjacent to Sand Coulee Creek. Seventy-three families presently live in the Rural Improvement District (R.I.D.) which is located in a low area within the 100-year floodplain. Residents have experienced severe flooding in the past and currently have problems with high groundwater. The high groundwater situation has resulted in basement flooding, saturated septic tank drainfields, and domestic well contamination.

An earthen drainage ditch runs through the Gibson Flats R.I.D. and was designed to provide drainage to Sand Coulee Creek, approximately one mile south of the R.I.D. boundary. The R.I.D. was formed to construct the drainage ditch to reduce long-term ponding problems in the area, to provide drainage for local surface runoff, and for urban runoff from southeastern Great Falls. The ditch has a very flat gradient which prevents water from adequately draining. Residents now feel that the open ditch has aggravated their groundwater problem and added a health hazard.

Cascade County requests a grant on the behalf of the Gibson Flats residents to reconstruct a portion of the ditch to provide drainage and prevent infiltration. The project includes cleaning and grading of the existing earthen ditch to provide the maximum feasible gradient. Drainage capacity of the ditch is expected to be increased and ponding areas minimized. The ditch will also be concrete-lined with a Gunitite seal to prevent infiltration. The remaining length of ditch will be renovated when additional funding is secured.

TECHNICAL ASSESSMENT:

A 1973 Soil Conservation Service (SCS) Flood Hazard Analysis report documented the location of Gibson Flats in the 100-year floodplain.

The Gibson Flats area is very susceptible to surface flood events from Sand Coulee Creek and to local drainage problems associated with the natural depression in which the community is located. Other factors which may contribute to high groundwater include increased inflow to the area due to urban runoff from development in southeast Great Falls. Other land use changes such as installation of septic systems and local irrigation also contribute to the water table. Protection from both floods and high groundwater are required to prevent property damage. The predicted high flood elevations and natural drainage problems dictate a very difficult and costly solution. The SCS proposed substantial flood protection measures for the Sand Coulee and Gibson Flats areas, but local support to pursue a Watershed Protection and Flood Prevention Project through the SCS did not materialize. Relocation of residences may be the best approach to avoid the threat and damage of these severe floodplain-related problems.

The proposed project only deals with a part of the problem identified and does not appear to solve the problem addressed.

FINANCIAL ASSESSMENT:

Of the \$100,000 grant requested, professional services will make up \$12,900 of the total project costs with construction costs and contingencies accounting for the remaining \$87,100.

The residents of Gibson Flats are currently repaying a \$68,000 bond over 15 years for the original ditch construction. Average annual fees are \$123 per year and \$10 per year for maintenance. Any further assessments will be an economic burden.

ENVIRONMENTAL ASSESSMENT:

The renovation of a portion of the ditch may help reduce some of the area's surface runoff problems and possibly alleviate some of the groundwater percolation. However, during flooding, Sand Coulee Creek will back up into the ditch and could flood the Gibson Flats area, causing additional problems. Renovation of a portion of this ditch will not take care of all of the groundwater problems and contaminated wells may still exist. Standing water and mosquito problems may be eliminated but the effects of this project will only be short-term until flooding occurs.

The impact of any structural improvements is unknown at this time.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for the proposed ditch renovation because it will not result in a complete solution to both surface and groundwater problems. A solution which will economically protect the area from serious flooding is needed.

The Soil Conservation Service has investigated the area's water problems and prepared a preliminary flood protection plan which could be pursued under the SCS Watershed Protection and Flood Prevention Program. It is suggested that the Gibson Flats residents work with the SCS to investigate their opportunities for flood protection.

CHAPTER II

THE WATER DEVELOPMENT PROGRAM - LOANS GREATER THAN \$200,000

A. Program Description and History

In 1981, the legislature adopted S.B. 409 which provided for the issuance of up to \$250 million in Montana coal severance tax bonds "for financing specific water resource development projects and activities in the state authorized by the legislature."

Statute provides that loans from coal severance tax bond proceeds be administered by the Department of Natural Resources and Conservation, and that projects be reviewed to determine their technical and financial feasibility. The Department has been working since 1983 with project sponsors authorized to receive loans from coal severance tax proceeds to assure project feasibility and prepare for local bond purchase transactions. In February 1984, the Montana Supreme Court case, Grossman vs. State of Montana, which was brought to test the constitutionality of the bonding authority was resolved in the state's favor and preparations began for the first Montana Coal Severance Tax Bond. A \$10,485,000 issue was sold in August 1984. The 20-year bond was sold for 10.26 percent.

In September 1985, a \$16,865,000 bond was sold at an interest rate of 9.29%. This issue rebated the September 1984 Bond and provided approximately \$6 million additional funds at a savings of \$50,000 to the state. In December 1985, an \$11,500,000 bond was sold at a variable rate of interest. This issue provides an attractive interest rate which was 4.5% in September 1986. This rate will offset interest subsidy costs and reflect a substantial savings to the Coal Severance Tax Trust Fund.

Loan applications for the next coal severance tax bond issue were submitted during the spring of 1986. Applications were reviewed for technical and financial feasibility and feasible projects were recommended for loan approval to the Water Development Advisory Council. The Council's recommendation is submitted to the department director and then to the governor, who will make his recommendation to the legislature.

B. Interest Rates

The interest rate on loans to public entities made from coal severance tax bond proceeds is established by the legislature, and coal severance tax revenues can be used to reduce the interest rate on these loans, which are made from state bond proceeds, below the rate at which the state bond is sold. Therefore coal severance tax bonds are payable from revenues of the water development projects financed by the bond proceeds and from coal severance tax proceeds. To implement these repayment provisions, the statute established a fund structure within the permanent coal tax trust fund. A coal severance tax bond fund was established to which coal tax revenues are credited when collected and from which transfers are made to the coal severance tax permanent trust fund except for the amount necessary to meet the coal severance tax bond principal and the interest payable on the next two semiannual payment dates. The project revenues and monies in the coal severance tax bond fund secure these bonds.

The 1985 Legislature requested that the Department recommend a methodology for giving differential interest rates to the projects recommended for loans. A method has been derived that considers the user rate as a percentage of "the median family income" on municipal projects.

C. 1986 Loan Applications

Graphs 3 and 4 give a breakdown by applicant and project type of the eleven Coal Severance Tax Loan applications submitted to the Department.

Table 2 lists the Coal Severance Tax Loan applications received in 1986 and the loan recommendations made by the Department. If less than 1% of "the median family income" is used to

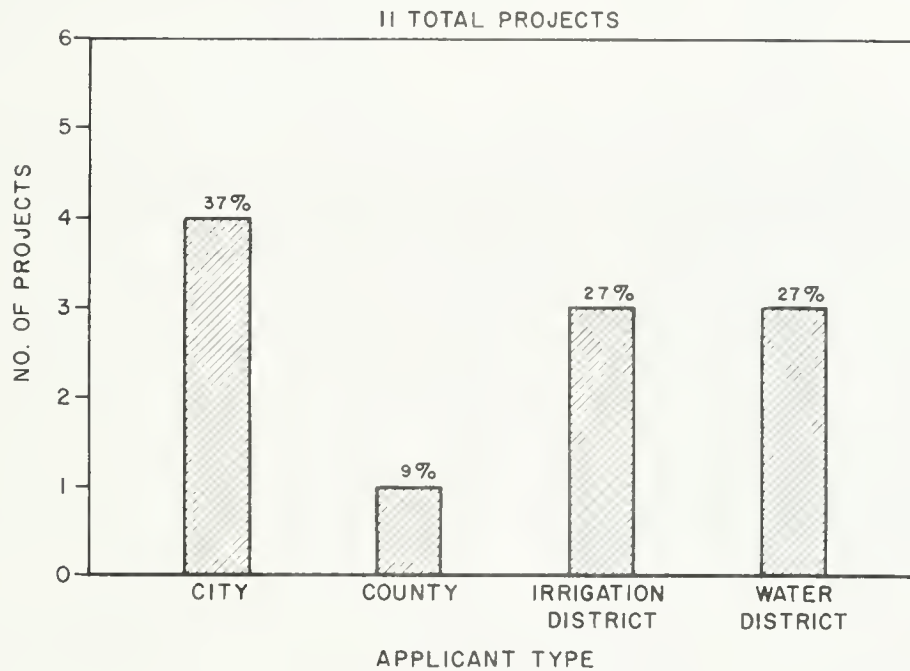
pay user rates, then no subsidy was recommended. If the user rate is at least 1% but less than 2%, then a 1% interest rate subsidy for five years was recommended. If the user rate is at least 2%, but less than 4%, then a 2% interest rate subsidy for five years was recommended. If the user rate is greater than 4% of the "median family income", then a 3% interest rate subsidy for five years was recommended.

As shown on Table 2, two irrigation projects are being recommended for 30-year loans at 3%. These are terms which will provide cashflow for the projects and are consistent with terms given to similar projects funded in previous bienniums. One state-owned project is recommended to be funded at the state bond rate for twenty years.

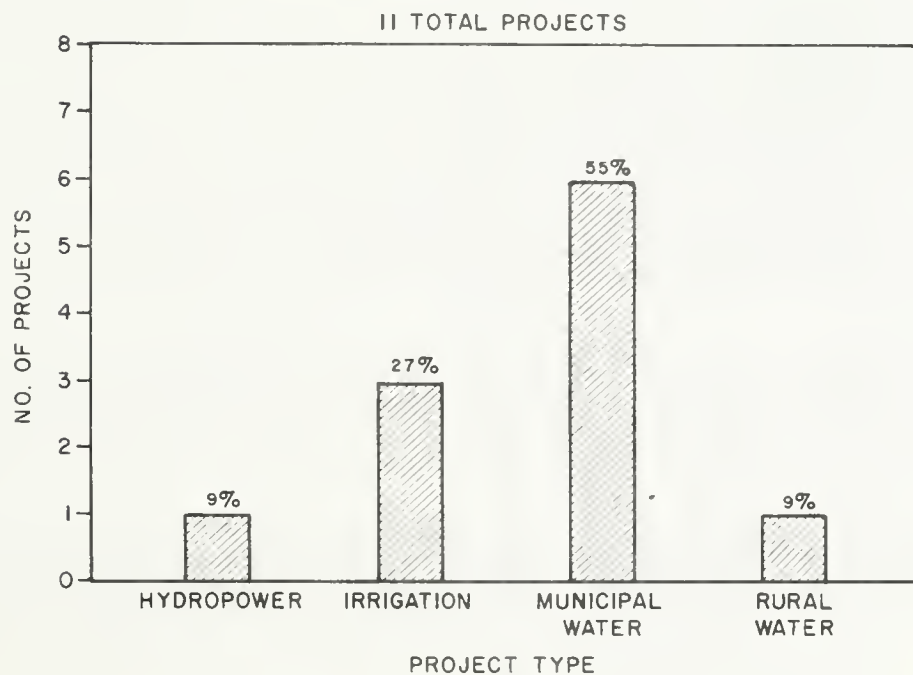
Detailed project summaries follow Table 2.

1986 APPLICATIONS
WATER DEVELOPMENT PROGRAM
COAL SEVERANCE TAX LOANS

GRAPH 3
BREAKDOWN BY APPLICANT TYPE



GRAPH 4
BREAKDOWN BY PROJECT TYPE



Note: Percents at tops of columns represent percentage of total applications.

TABLE 2

WATER DEVELOPMENT PROGRAM
COAL SEVERANCE TAX LOANS

| APPLICANT NAME | PROJECT NAME | LOAN RECOMMENDED | PERCENTAGE RATE AND TERM |
|--|---|---------------------|--|
| BITTER ROOT IRRIGATION DISTRICT | NORTH HAMILTON HEIGHTS GRAVITY IRRIGATION | \$622,120 | 3% FOR 30 YEARS |
| BROWNING | WATER TREATMENT & TRANSMISSION FACILITIES | \$1,294,900 | 1% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| HARLEM | WATER SYSTEM IMPROVEMENTS | \$403,125 | 2% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| HELENA | TEN MILE WATER IMPROVEMENTS | \$10,202,600 | 2% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| | WATER SYSTEM IMPROVEMENTS | \$250,000 | 2% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| MILN RIVER IRRIGATION DISTRICT | TIBER DAM POWER PROJECT | \$19,655,900 | EQUAL TO BOND RATE FOR 20 YEARS |
| MILL CREEK WATER & SEWER DISTRICT | GRAVITY SPRINKLER IRRIGATION | \$999,223 | 3% FOR 30 YEARS |
| MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS | GARTSIDE DAM | \$565,000 | EQUAL TO BOND RATE FOR 20 YEARS |
| SOMERS COUNTY WATER & SEWER DISTRICT | WATER DISTRIBUTION & SUPPLY IMPROVEMENTS | \$748,540 | 3% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| WEST YELLOWSTONE | WATER SYSTEM IMPROVEMENT | \$1,500,000 | 1% BELOW BOND RATE FOR 5 YEARS AND AT BOND RATE FOR 15 YEARS |
| ROOSEVELT CO. RURAL WATER DISTRICT | RURAL WATER SYSTEM | NO FUNDING | |
| TRAIL CREEK WATER ASSOCIATION | IRRIGATION DISTRICT RENOVATION | NO FUNDING | |
| YELLOWSTONE COUNTY | EMERALD HILLS WATER DISTRIBUTION | NO FUNDING | |

*REFER TO PROJECT #65 IN THE WATER DEVELOPMENT RANKING FOR PROJECT WRITE-UP

**REFER TO PROJECT #69 IN THE WATER DEVELOPMENT RANKING FOR PROJECT WRITE-UP

APPLICANT NAME: Bitter Root Irrigation District

PROJECT/ACTIVITY NAME: North Hamilton Heights Gravity Irrigation Project

AMOUNT REQUESTED: \$622,120 Loan

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$622,120

PROJECT DESCRIPTION:

The proposed North Hamilton Heights Gravity Irrigation Project is located in Ravalli County about five miles northeast of the Town of Hamilton. The area consists of 1,186 acres of irrigated land supplied with water by the Bitter Root Irrigation District (BRID) Canal. Approximately 726 acres are sprinkler irrigated and 460 acres are flood irrigated. The cropping pattern is estimated to be 35% alfalfa hay and 65% grass pasture. The supply of water is adequate throughout the irrigation season, but the delivery system cannot properly service all the users due to inefficiencies and insufficient capacity.

Under the proposed project, the North Hamilton Heights flood irrigation system will be abandoned, and a new gravity sprinkler irrigation system will be installed. This will allow BRID to service all canal users adequately. The proposed cropping pattern will be changed to 53% alfalfa, 7% spring grain, and 40% grass pasture. An inlet structure will be installed in the BRID canal, 6.7 miles of pipeline will be buried, and various structures such as pressure reducers, air valves, and drains will be installed.

This project will result in 50% reduction in water use, increased crop production, reduced operation and maintenance costs, reduced need for weed control, reduced soil erosion, improved water quality, and reduced energy consumption.

TECHNICAL ASSESSMENT:

The technical information presented in the application is preliminary and provides only a general understanding of the project. It is reasonable to assume that the project has a significant opportunity to be technically successful; however, the financial capability of the project is not so apparent. Further analysis is needed to minimize financial risk and to provide a better understanding of the project and its impacts. A Soil Conservation Service (SCS) watershed level plan or Resource Conservation and Development measure plan may provide an appropriate level of detail.

FINANCIAL ASSESSMENT:

The total project cost is estimated to be \$622,120. Of that, \$18,000 is budgeted for administration, \$64,000 for engineering, \$10,000 for land easements, \$435,000 for materials and construction, and \$95,120 for inflation and contingencies. On-farm treatment is estimated to cost \$136,800. Based on these figures, annual costs will vary between \$38/acre and \$62/acre, depending on the financing. In addition, annual operation and maintenance costs are estimated to be \$12/acre. Therefore, the total annual cost of this project will vary between \$50 and \$75/acre.

Project revenues are estimated at \$122/acre and assume a high level of management. Variations in the estimated yields and costs due to land debt and management quality could reduce these benefits. Further analysis is needed to ensure that the project is financially feasible.

ENVIRONMENTAL ASSESSMENT:

The environmental impacts of this project have not been adequately reviewed and are unknown at this time. However, all indications seem to suggest the impact of this project on the environment will be positive through improved water quality in creeks used for irrigation drainage, reduced erosion, better use of water, and reduced weed control problems.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a loan of \$622,120 at three percent for a term of 30 years. The loan is contingent on the completion and approval of a more detailed analysis of project costs and benefits, and on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Town of Browning

PROJECT/ACTIVITY NAME: Water Treatment and Transmission Facilities

AMOUNT REQUESTED: \$1,294,900 Loan

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$1,294,900

PROJECT DESCRIPTION:

The town of Browning, located in Glacier County, supplies water to 4,139 people. The water system provides service beyond the city limits. Groundwater is the sole source of supply. A series of infiltration galleries located at the upper reach of Flatiron Creek are interconnected, and a pump lifts the combined flow of 350 gallons per minute (gpm) into a transmission pipeline approximately five miles west of town. Located near the galleries are three shallow wells, which together provide a total of 240 gpm and are connected to the transmission pipeline. A 100,000-gallon water storage and chlorination station is located on the edge of town and provides adequate water treatment. Four additional wells are located within the town's water distribution grid. Total flow potential from all sources is estimated at 1,330,300 gallons per day and four reservoirs can store up to 1,200,000 gallons. The distribution system is adequate. During the summer of 1985, Browning experienced severe and prolonged shortage of water throughout the service area and studies predict that by the year 2010 Browning will have a water shortage in excess of 1,000,000 gallons per day.

To alleviate the shortage problem, Browning proposes to divert surface water from Cut Bank Creek and construct a 2.5-million-gallon per day water treatment facility. The treatment plant will include a raw water sedimentation and storage pond with gravity flow into a vacuum filter system, using diatomaceous earth. The filtered water will be chlorinated and stored in a clear well, and high service turbine pumps will convey the water to the existing distribution system.

TECHNICAL ASSESSMENT:

In 1986, an engineering firm was hired to prepare a "Water Supply Analysis for the Town of Browning". Water shortages prompted the town to look into additional or alternate supply for their needs. In this application not enough information was available to substantiate the claim that surface water from Cut Bank Creek is the only adequate source of supply available. Reviewers feel that surface water should only be used as a last resort as a supply source, and recommend that groundwater sources in the area be further investigated.

However, the water treatment alternative selected for the surface water supply proposal appears to be appropriate, technically feasible, and should produce the desired effects. The Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences agrees with the concept of this surface water treatment alternative and recognizes that a source of water is needed. The design for all improvements must be reviewed and approved by the WQB before construction begins.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$1,294,900, of which \$1,019,700 are costs of construction and contingencies, and the balance is for engineering, legal review, financing, and administration. The requested DNRC loan is for the total project cost. Users' water rates will triple from \$5.02/month to \$15.06/month to repay the loan.

The estimated project costs appear to be realistic and reasonable for a surface water treatment alternative. However, the most cost-effective alternative may be to use existing water supply and develop groundwater supplies as a supplement if adequate sources are found to be available.

ENVIRONMENTAL ASSESSMENT:

A preliminary assessment indicates that the only adverse impacts that will result from this project are those minor, short-term effects typically associated with construction projects. A more thorough analysis of the impact to Cut Bank Creek and its water quality and fishery resource must be conducted prior to selecting the final alternative.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a loan of \$1,294,900 to be repaid over a maximum of 20 years, contingent on further investigations conducted to determine if any reliable groundwater sources exist in the area. A hydrogeological assessment of any wells in the area should also be completed. The Bureau of Indian Affairs (BIA) should be approached and encouraged to help fund this investigation since housing developments for tribal members are supplied water from the Browning water system.

If reliable groundwater sources are found in the area, then an alternative should be developed to use these sources as a supplement to the existing water supply. If conclusive information proves that no adequate groundwater is available, then the surface water source should be used, and if possible the existing supply should be used as a supplement so that a smaller capacity surface water treatment plant alternative could be considered.

If the most cost-effective alternative appears to be the surface water treatment plant as proposed, then due to local adverse economic conditions and the high cost of the surface water treatment alternative, the town must hold an election to authorize any bonded indebtedness involving this loan. If the election authorizes the loan, then DNRC recommends an interest rate of one percentage point below the rate at which the state bond is sold for the first five years, and the coal severance tax bond rate for the remaining 15 years. Any reduction in the loan request will result in recalculation of the loan interest rate. This rate will be based on the annual water rates in relation to the median family income. Any reduction in the project scope must not affect priority improvements. All water rights issues for use of water from Cut Bank Creek must be settled before loan funds will be awarded.

Since the BIA has housing developments directly affected by this project, and since the developments affect demand for water from the Browning water supply, DNRC requires reasonable funding assistance for this project to be provided by the BIA before the DNRC loan will be authorized.

APPLICANT NAME: City of Harlem

PROJECT/ACTIVITY NAME: Water System Improvements

AMOUNT REQUESTED: \$403,125 Loan

OTHER FUNDING SOURCES AND AMOUNTS:

Community Development Block Grant (CDBG) - \$350,000; Farmers' Home Administration (FmHA) - \$400,000

TOTAL PROJECT COST: \$1,153,125

PROJECT DESCRIPTION:

Harlem is a rural community of 1,023 people located in Blaine County in north-central Montana. The community water system consists of an intake structure located just south of Harlem on the Milk River from which water is pumped at a rate of 1,400 gallons per minute (gpm) to a 12.5-million-gallon storage and settling pond. The settled water is then treated at a water treatment plant. The treated water is stored in a 50,000-gallon clear well and then pumped at 350 gpm through a 10-inch water supply main to a 50,000-gallon elevated steel tank on the south side of town. A 10-inch main connects the water tank to the distribution system which consists primarily of 6-inch and 8-inch pipe.

The treatment plant needs repair, and some equipment needs to be replaced. The 50,000-gallon storage tank is 50 years old but has recently been renovated and is in good condition, but does not provide adequate storage for fire protection. Numerous dead-end mains exist in the distribution system and contribute to low flows during fires, and could cause stagnant water problems. The distribution system

consists of cast iron pipe which has breaks, and many mains are too small to deliver adequate flows for fire protection. Insufficient and deteriorated gate valves also hamper effective shutdown of portions of the distribution system.

The proposed project consists of replacing substandard portions of the existing main and installing new coupling mains to better loop the system. These improvements will help bring the distribution system up to a satisfactory fire protection level and meet maximum day consumer demands. A single 400,000-gallon at-grade storage tank located on a hill one mile north of the City will replace the existing 50,000-gallon elevated storage tank. A new 12-inch-diameter main will supply the water to the city, and will provide adequate storage for fire protection.

TECHNICAL ASSESSMENT:

In 1985, Harlem hired an engineering consulting firm to prepare a comprehensive study of the City's water distribution system. The study addressed all of the water distribution and storage system deficiencies and outlined a program for upgrading the system. The sanitary engineering staff at Montana State University concurrently conducted an evaluation of the water treatment plant and concluded that some deficiencies exist in the plant. The Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences agrees that one of Harlem's main priorities should be upgrading the existing water treatment plant. However, the WQB does believe the proposed improvements are needed and they will approve of the concept. The WQB must review and approve all design for the improvements before construction starts.

FINANCIAL ASSESSMENT:

The total project costs are estimated at \$1,153,125, of which \$984,307 are costs for construction and contingencies and the balance is for engineering, financing, and administration. The application is for a loan of \$403,125, and Harlem will establish a city-wide Special Improvement District with an average annual assessment per property owner of approximately \$108.92 to repay the DNRC loan.

Harlem will request a \$350,000 grant from the CDBG program and a \$400,000 loan from FmHA. The FmHA loan will be repaid with a revenue bond. The estimated project costs appear to be realistic and reasonable for this project, and it appears that the most cost-effective alternative was chosen.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will occur from this project are those minor, short-term effects typically associated with construction projects. Positive effects will result in improved fire protection and some water quality improvements in some areas of the city.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a loan of \$403,125 at an interest rate two percentage points below the rate at which the state bond is sold for the first five years, and at the coal severance tax bond rate for the remaining 15 years, contingent upon Harlem having an engineering evaluation of the existing water treatment plant conducted and included in a final water system analysis. The water treatment plant should be evaluated along with the water distribution and storage system priority improvements. Priority items should be accomplished first. Any reduction in the loan request will result in recalculation of the loan interest rate. The rate will be based on the annual water rates in relation to the median family income. Any reduction in scope should not affect priority improvements.

APPLICANT NAME: City of Helena

PROJECT/ACTIVITY NAME: Ten Mile Water Improvements

AMOUNT REQUESTED: \$10,202,600 Loan

OTHER FUNDING SOURCES AND AMOUNTS: None

TOTAL PROJECT COST: \$10,202,600

PROJECT DESCRIPTION:

The purpose of this project is threefold: to construct a Ten Mile Water Treatment Plant to comply with the order issued by the Department of Health and Environmental Sciences (DHES) dated December 5, 1985, to provide the necessary improvements to rehabilitate Chessman Dam, and to replace 17,000 feet of transmission mains with one 33-inch main of equivalent capacity. After completion of the project, the Ten Mile water system will meet the projected water demands for year 2007; the finished water will meet all federal and state water quality standards; and Chessman Dam will meet the safety standards of the Department of Natural Resources and Conservation.

The project will include the construction of a 9-million-gallon per day (mgd) water treatment plant, and the installation of a floating membrane cover on the existing 6-million-gallon settling pond to convert it into a finished water storage reservoir. The major units of the treatment system are: static screens, contact absorption clarification units, gravity mixed-media filters, a waste washwater surge basin, waste washwater recovery basins, and sludge lagoons. Chessman Dam will be rehabilitated so that it can be used year-round. Use of the Ten Mile Water Treatment Plant will be maximized to reduce pumping costs needed to operate the Missouri River Water Treatment Plant.

TECHNICAL ASSESSMENT:

Due to a compliance order issued by the DHES, Helena was required to provide treatment for maximum turbidity contaminant levels in the Ten Mile supply, or find another source of water. An engineering study conducted in 1984 concluded that the most cost-effective source of water was the Ten Mile supply. Consequently, a pilot study was conducted to assess the best alternative for treatment of the Ten Mile supply and then a Preliminary Engineering Report for the Ten Mile Creek Water Treatment Plant was performed to evaluate preliminary design and a detailed cost estimate. Several alternatives for supply and treatment were evaluated.

The design of all proposed improvements will be reviewed and approved by the Water Quality Bureau (WQB) prior to commencement. The WQB agrees with and supports the concept of the proposed project and has rated it very high on their priority and needs list.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$10,202,600. The project is separated into three areas with the Ten Mile Water Treatment Plant cost estimated at \$6,917,000, the Ten Mile transmission line and corrosion control cost at \$2,189,000 and \$106,300 respectively, and the Chessman Dam rehabilitation cost at \$972,300. Total construction costs and contingencies for the three areas combined is \$8,941,200 with the balance being the cost of engineering, legal review, administration, and interest.

After potential water supply sources for the City of Helena were examined, cost alternatives compared, and water demands reassessed, the most cost-effective source of water appeared to be the Ten Mile supply. However, cost estimates for the Ten Mile Treatment Plant do appear to be fairly high in comparison with similar cost estimates of other recently constructed plants.

Revenue bonds will be sold to finance the improvements and revenue from water sales will be used to finance the payments. Assuming that Helena receives a subsidized DNRC loan the average monthly user's rate will go from \$24.99 in 1986 to \$39.44. This is an overall rate increase of 58%.

ENVIRONMENTAL ASSESSMENT:

During the construction phase there may be short-term negative impacts to soils, vegetation, and wildlife. Water quality in Ten Mile Creek may be periodically affected throughout the pipeline construction project.

The quality of Helena's water supply should be improved by this project.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a loan of \$10,202,600 from the sale of coal severance tax bonds, to be repaid over a maximum of 20 years. The interest rate shall be two percentage points below the rate at which the state bond is sold for the first five years, and the coal severance tax bond rate for the remaining 15 years. Any reduction in the loan request will result in recalculation of the loan interest rate. This rate will be based on the annual water rates in relation to the median family incomes. Any reduction in project scope should not affect priority improvements.

APPLICANT NAME: Milk River Irrigation Districts

PROJECT/ACTIVITY NAME: Tiber Dam Power Project

AMOUNT REQUESTED: \$19,655,900 Loan

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$19,655,900

PROJECT DESCRIPTION:

Tiber Dam is an earth-filled structure built across the Marias River southwest of Chester, Montana. The dam is 4,526 feet long with an elevation of 3,026 feet mean sea level (MSL). The reservoir is called Lake Elwell, and has a maximum capacity of 1,368,158 acre-feet of water at 3,012.5 feet MSL. The dam and lake are owned by the United States Government and managed by the Bureau of Reclamation.

There is a strong interest in hydropower development at the dam. A detailed study to determine the feasibility and hydropower development alternatives was authorized by the Milk River Irrigation Districts. The report from the study was made into an application for licensing and submitted to the Federal Energy Regulatory Commission (FERC). The project will be operated as a run-of-the-river power plant using water that is released from the dam for other purposes. The proposed facility will have an installed capacity of 12 megawatts and will generate electricity at an anticipated 71% efficiency, producing 75,020,000 kilowatt hours (kWhs) per year.

The powerhouse will be located within the stilling basin of the auxiliary outlet works. Water will be conveyed downstream from the auxiliary outlet gate through a pressurized steel line conduit to two turbines. Approximately 0.7 mile of new transmission line will be required to connect the plant with existing power transmission lines.

TECHNICAL ASSESSMENT:

The Federal Energy Regulatory Commission (FERC) has on file and in review status two other license applications for Tiber Dam. The technical study for this application was made by a recognized and reputable firm. The technical feasibility was determined by the average available water release, the average available operation head, the availability of an adequately controlled delivery system to the turbine, and the sizing of generators and turbines to maximize the efficiency of the overall project.

FINANCIAL ASSESSMENT:

The Milk River Irrigation Districts are reapplying for a loan for the Tiber Dam Power Project, and request that the loan be increased to \$19,655,900 for a total increase of 10% over the original loan request of \$17,869,000.

The new cost of the project is estimated at \$19,655,900 (including contingencies). This fits within the "rule of thumb" range for hydropower development of \$1,200 to \$2,000 per kW, being \$1,638 per kW. Assuming a 66% efficiency rather than the 71% expected, gross output will be 69,000,000 kWhs per year,

which at the July 6, 1986 levelized rate, yields a return of \$2,881,000 annually. Gross operational expenses and loan repayment are estimated at \$2,400,000 annually. This indicates a probable strong positive cash flow.

Profits from the project will be used by the Milk River Irrigation Districts to increase their irrigation water supply in areas of water shortages, bring about water management projects, and pay operation and maintenance costs throughout the Districts.

The Districts have statutory authority to issue revenue bonds which will be sold to the state under the coal severance tax bond program to finance the Tiber Dam Power Project.

ENVIRONMENTAL ASSESSMENT:

Negative, short-term impacts on the reservoir are expected to be minimal as no direct construction will occur upstream of the dam, nor will the water level be drawn down for project construction purposes. Negative, short-term impacts on the lower Marias River are associated with the construction of the cofferdam in the stilling basin, which will result in temporary increases in turbidity and siltation loads. Temperatures of water released from the dam have been studied to determine how to maintain existing temperature ranges to benefit a diversified fish habitat. Continued monitoring will take place to determine when to blend waters to control the water temperature. The Water Quality Bureau is evaluating this condition, and has not yet issued a permit.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a loan of \$19,655,900 for the same term and at the same interest rate as the state Coal Severance Tax Bond which will be sold to provide these funds. Funding is contingent upon the applicant: (1) receiving the necessary FERC license; (2) negotiating a signed power purchase agreement for the purchase of all power produced; (3) establishing a reserve fund to mitigate the risk of low water flows in the early years of the project and to insure loan repayment; (4) receiving the necessary state water rights for hydropower purposes; (5) receiving the necessary federal rights required to develop hydropower on the U. S. Bureau of Reclamation's Tiber Dam; (6) demonstrating the economic feasibility of the project using the most recent avoided cost rates; (7) adequately complying with all articles of the FERC license; and (8) assuring that once construction commences, the project will be completed and operated at least through the repayment period of the loan.

APPLICANT NAME: Mill Creek Water and Sewer District

PROJECT/ACTIVITY NAME: Mill Creek Gravity Sprinkler Irrigation Project

AMOUNT REQUESTED: \$999,223

OTHER FUNDING SOURCES AND AMOUNTS:

Soil Conservation Service (SCS) - \$1,527,100; Mill Creek Water and Sewer District - \$418,000

TOTAL PROJECT COST: \$2,944,323

PROJECT DESCRIPTION:

The proposed project is located in Park County, about 20 miles south of Livingston, Montana. The area is composed of 3,300 acres of irrigated hay and pasture adjacent to Mill Creek. In order to flood irrigate 2,160 acres of hay and pasture, and to pump sprinkler irrigate 1,140 acres of hay and pasture, 26,000 acre-feet are annually diverted out of Mill Creek. Water shortages then occur late in the year, with shortages beginning on July 15 in dry years, and always by August 15th. In addition, the significant dewatering of Mill Creek has not allowed the creek to serve as a spawning tributary for Yellowstone River cutthroat trout.

Under the proposed project, the Mill Creek Water and Sewer District will install a new diversion structure, a pipe flume, 4.2 miles of canal, 11.6 miles of pressurized delivery pipelines, a wasteway structure, and other appurtenant structures. This system will replace three parallel canals. Overall, the

project efficiency will improve from 8% to 44%, reducing the total irrigation requirement from 26,000 acre-feet per year, to 10,000 acre-feet per year. This conservation will revive Mill Creek as a spawning tributary for Yellowstone River cutthroat trout by significantly increasing the instream flow. Crop yields will increase from 39% to 90% of potential, and electrical use will be reduced by 83%.

TECHNICAL ASSESSMENT:

The SCS made a preliminary design of the system, and found the project to be technically feasible. The analysis performed is consistent with current standards and appears to be technically sound. Some reviewers have expressed concern that the estimated yield of 4.5 tons/acre is too optimistic.

The SCS will complete the final project design, and will provide on-farm management assistance for two years following the construction of the project.

FINANCIAL ASSESSMENT:

The total cost of the project, including inflation and contingencies, is \$2,944,323. Construction of the gravity sprinkler delivery system is estimated to cost \$1,792,400. The purchase and installation of the sprinkler systems will cost \$917,900, and \$234,023 is included to cover inflation and contingencies. The District will own the delivery system and will assess a fee to cover construction, operation, and maintenance costs. The SCS will provide 50% cost share for both the construction of the delivery system and the on-farm treatment. The total federal share will be \$1,527,100 and the non-federal share will be \$1,417,223. Of the non-federal share \$999,223 will be for delivery system construction and \$418,000 will be for on-farm system construction. The Mill Creek Water and Sewer District requests a loan of \$999,223 to cover delivery system construction costs.

ENVIRONMENTAL ASSESSMENT:

An evaluation team consisting of representatives of the U.S. Fish and Wildlife Service, Montana Department of Fish, Wildlife and Parks, and the SCS investigated impacts of this project on threatened and endangered species, historic and archaeological sites, wildlife and fishery resources, wetlands, visual resources, water quality, and other environmentally unique or sensitive areas. It was determined that there will be no significant environmental problems, conflicts, or disagreements among groups or agencies. Based on this, there are no significant impacts which will require an environmental impact statement. In addition, there is the positive effect of providing an additional spawning tributary for Yellowstone River cutthroat trout.

RECOMMENDATION AND CONTINGENCIES:

The Department recommends a loan of \$999,223 at three percent for a term of 30 years.

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| <u>APPLICANT NAME:</u> | Somers County Water and Sewer District |
| <u>PROJECT/ACTIVITY NAME:</u> | Water Distribution and Supply System Improvements |
| <u>AMOUNT REQUESTED:</u> | \$748,540 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$748,540 |

PROJECT DESCRIPTION:

The water system in Somers was built in 1905 by the Burlington Northern Railroad (BN) and presently serves 375 people in 140 homes along the north shore of Flathead Lake. Major water system facilities include an intake from Flathead Lake, a pump vault and chlorination station, a 100,000-gallon elevated steel storage tank, fire hydrants, and a distribution system. The Somers County Water and Sewer District was formed in 1981 to assume the operation of the water system from BN, and the final purchase contract was signed in November 1984.

The water supply from Flathead Lake has serious turbidity problems during the spring. In addition, the Department of Health and Environmental Sciences issued a "boil advisory" effective June 1, 1986 due to the presence of giardia cysts in tributaries to Flathead Lake. The pumping system is manually operated and the chlorination system cannot meet maximum demands. Distribution line sizes are inadequate in many areas to handle flows for domestic use or fire fighting, are not buried below the frost line, and are not properly looped. Valves and fire hydrants need maintenance, repair, or replacement. Storage is inadequate to meet fire flow demands, and the tank needs to be repaired.

The district proposes to drill two wells capable of producing the maximum daily demand of 344 gallons per minute (gpm). All small diameter mains less than four inches in size will be replaced with PVC or ductile iron, at a size capable of meeting future requirements of the system.

TECHNICAL ASSESSMENT:

In 1986, an engineering firm was retained to prepare a "Preliminary Engineering Report for Water System Improvements for Somers County Water and Sewer District". The study was comprehensive, addressed the water system deficiencies, and outlined a recommended program for upgrading the system based on priorities. The most needed improvements were identified as Phase I, water supply and small diameter main improvements. The alternatives for a supply source were identified and assessed. Replacing undersized mains was the only practical solution to the problem. The project appears appropriate, technically feasible, and should produce the desired effects.

The design for all improvements will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences before construction begins. The WQB agrees with the concept and need for the project.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$748,540, of which \$623,910 are costs of construction and contingencies and the balance is for engineering, legal review, and administration. The loan requested is for the total project cost. The estimated project costs appear to be realistic and reasonable, and it appears as though the most cost-effective alternative was chosen. The district will issue a revenue bond for the anticipated loan amount. The user rates will increase from \$20 per month to \$63.34 per month in order to repay the loan.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with construction projects. Positive effects will be improved water quality and the elimination of the imminent health hazard of giardia.

RECOMMENDATIONS AND CONTINGENCIES:

DNRC recommends a \$748,540 loan from the sale of coal severance tax bonds to be repaid over a maximum of 20 years. The interest rate shall be three percentage points below the rate at which the state bond is sold for the first five years, and at the coal severance tax bond rate for the remaining 15 years. Any reduction in the loan request will result in recalculation of the loan interest rate. This rate will be based on the annual water rates in relation to the median family income. Any reduction in project scope should not affect priority improvements.

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| <u>APPLICANT NAME:</u> | Town of West Yellowstone |
| <u>PROJECT/ACTIVITY NAME:</u> | Water System Improvement Project |
| <u>AMOUNT REQUESTED:</u> | \$1,500,000 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$1,500,000 |

PROJECT DESCRIPTION:

West Yellowstone has a resident population of about 700 people, and a short-term summer population of 7,000 to 8,000 people who typically are visiting nearby Yellowstone National Park. There is no central water supply and no storage or distribution facilities for the town. There are approximately 250 private wells which serve homes, businesses, and town facilities. The Madison Addition is a 164-acre subdivision with 862 residential living units. It has a separate water system which includes a 75,000-gallon elevated storage reservoir, two wells with a combined capacity of 140 gallons per minute (gpm), 22,000 feet of distribution lines, and 32 fire hydrants. This system is in good condition, and for the past year has been operated by the town. The town also has three other wells with a combined capacity of 330 gpm that are used primarily to serve town facilities and irrigate park and lawn areas.

The town requests funding for a central supply and water distribution system for the following reasons: (1) there is no storage available to provide water for fire protection; (2) during power outages and other maintenance emergencies, homes and tourist facilities are without domestic water; (3) operation and maintenance costs for individual wells are quite costly; and (4) the majority of the wells serving the original townsite have a high flouride concentration, which poses a health concern.

Proposed improvements consist of a completely looped water distribution system providing a main transmission line through the center of the original townsite in the east-west direction, and branching mains in the streets in the north-south direction. The water source will be from Whiskey Springs, a 3,000 gpm spring located southwest of town. The spring will supply 900 to 1,000 gpm of water flowing by gravity for two miles through a 12-inch buried pipe, and connecting to an 800,000-gallon storage tank constructed on a butte southwest of town. The water will then flow approximately 2.25 miles to town through a 16-inch pipe and connect to the distribution system.

TECHNICAL ASSESSMENT:

A water study for West Yellowstone was conducted by an engineering firm to evaluate the current water problems and to find alternatives for providing an adequate supply and distribution system. The water study identified the selected alternative as the most cost-effective and best solution to the water problems. The proposed project is technically feasible and will solve the identified problems.

The design of the proposed improvements will be reviewed by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences prior to starting construction. The WQB agrees with the need for the project and proposed solution.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$1,500,000, with the water distribution system costing \$690,000 and the water transmission line, storage tank, and spring development accounting for \$810,000. Construction and contingencies are estimated to cost \$1,380,000, while the balance will be for engineering, financing, legal review, and administration.

The town has identified the DNRC as the only source of funding and proposes to repay the loan by issuing a revenue bond or using revenue generated from West Yellowstone's resort tax. Revenues from the tax are estimated to be \$500,000 per year. To repay a revenue bond, a monthly user rate of \$16 would be assessed.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with municipal utility construction projects. Positive impacts will result in fire protection and an improved water source for the town.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a \$1,500,000 loan from the sale of coal severance tax bonds to be repaid over a maximum of 20 years. The interest rate shall be two percentage point below the rate at which the state bond is sold for the first five years, and at the coal severance tax bond rate for the remaining 15 years. Any reduction in the loan request will result in recalculation of the loan interest rate. The rate will be based on the annual water rates in relation to the median family income. Any reduction in project scope should not affect priority improvements.

Funding shall be contingent upon: (1) a complete project scope, which will include initial development of an acceptable water supply followed by the water distribution system including all necessary

appurtenances; (2) a town election to authorize any bonded indebtedness involving this loan to assure citizen support, since the project requires conversion from private well sources to a public water system; and (3) legislative approval for the town to use revenues generated from the resort tax to repay the loan for this project, if that is the town's intent.

APPLICANT NAME: Roosevelt County Rural Water District

PROJECT/ACTIVITY NAME: Rural Water System

AMOUNT REQUESTED: \$2,420,500 Loan

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$2,420,500

PROJECT DESCRIPTION:

The Roosevelt County Rural Water District proposes to construct a rural water system that will supply 180 users in a six- by twenty-mile area north of Culbertson. The system will supply farmers and ranchers with domestic and stock water, as well as provide municipal water for the communities of Froid and Fort Kip. Approximately thirty percent of the rural area residents now haul water. The remainder use wells which generally supply poor quality water. Water quality problems include hardness, high concentrations of iron, sulfates, and dissolved solids. One well which serves thirty families was found to contain selenium at concentrations which exceed federal safe drinking water standards. Water shortages are also a problem. Froid has had to ration water and many rural wells frequently run dry.

The proposed central distribution system will consist of PVC pipe and will carry water from Culbertson's water treatment system to the district members. An underground reservoir, with booster pumps and in-line boosters to supply pressure, is also part of the proposed system.

TECHNICAL ASSESSMENT:

Preliminary design and layout for the proposed system was developed for the applicant by an engineering firm in 1984. Trickle flow systems are often the design chosen for projects of this type; however, in this case, the engineers recommended a pressure system capable of full peak period service. This recommendation was made after preparing preliminary designs and cost estimates for both types of systems. The water system will receive its supply from Culbertson's new water treatment facility.

Since the application is for both final design and construction funding, no detailed plans of the system have been prepared. Given the extended distances and dead-ended lines, the design will require detailed hydraulic analyses and careful placement of appurtenances. As with other water systems, the completed design will require review and approval by the Water Quality Bureau of the Department of Health and Environmental Sciences.

FINANCIAL ASSESSMENT:

The total project cost is estimated to be \$2,420,500, of which \$2,008,300 are costs for construction and contingencies and the balance is engineering, legal, financial, and administration. The loan will cover the total project cost. The estimated project costs seem realistic and reasonable; however, rural water user fees will have to be \$150 per month to finance the revenue bond that the district proposes to use to support the project.

ENVIRONMENTAL ASSESSMENT:

The project will include many miles of ditch excavation for the water system pipeline. Construction activities are expected to result in short-term erosion problems and loss of vegetation. Much of the construction will parallel existing roads and public right-of-way. Final impacts must be addressed in the design and permitting phase. There are no expected long-term negative impacts. Following construction, complete reclamation will be required to correct land disturbance.

RECOMMENDATION AND CONTINGENCIES:

The Roosevelt County Rural Water District requests an extension of a previously granted DNRC coal severance tax bond loan. Due to the project economics, DNRC recommends that the loan authority for this project not be extended. If the project economics become more positive or if grants are obtained to reduce the user rates, then a DNRC loan may again be requested.

APPLICANT NAME: Trail Creek Water Association

PROJECT/ACTIVITY NAME: Trail Creek Irrigation District Renovation Project

AMOUNT REQUESTED: \$975,972 Loan

OTHER FUNDING SOURCES

AND AMOUNTS: Project Landowners (In-kind) - \$178,530; Soil Conservation Service (SCS) (In-kind) - \$26,000

TOTAL PROJECT COST: \$1,180,502

PROJECT DESCRIPTION:

The proposed Trail Creek Irrigation District Renovation Project is located approximately six miles west of Wisdom in Beaverhead County. The project involves reconstructing a ditch system and preparing land for flood irrigation on 3,000 acres.

The applicant is the Trail Creek Water Association (TCWA) comprised of four ranchers. Project ownership varies from 1,950 acres (65% of the irrigated acres) owned by one individual to 60 acres (2% of the irrigated acres) owned by another. The TCWA intends to form an irrigation district in order to qualify as a public entity eligible for a Coal Severance Tax loan.

The irrigation system has been out of service since the early 1900s. The system diverts water from Trail Creek into a canal on Beaverhead National Forest land. The canal progresses along Trail Creek, transects the Big Hole National Battlefield, and then crosses the land to be irrigated.

TECHNICAL ASSESSMENT:

The preliminary project planning and analysis has been conducted by the SCS. The distribution system plan and cost estimates appear reasonable when considering the preliminary level of study involved. Further documentation of water availability, canal lining requirements, proposed storage facilities, field structures, and land leveling requirements will be necessary to document feasibility before detailed final design begins.

Project operations include 60% pastureland for summer pasture and 40% hayland to supplement existing ranch hay needs. Climatic conditions for this type of operation are harsh, with the area elevation near 6,200 feet and a frost-free season of only 30 days. Careful stand establishment and a high level of irrigation and production management will be required to consistently achieve the needed returns. The economic analysis provided by the applicant shows a benefit-to-cost rate of 1.1/1.0 for this operation. This analysis did not include direct allowances for contingencies, inflation, interest during construction, or financing costs. Since this project appears only marginally feasible and includes uncertainties in both costs and returns, further analysis is needed.

The applicant is in the process of obtaining the permits necessary for this development. The greatest concern in this area relates to the water rights claimed for this project. The applicant has claimed a water right of 176 cubic feet per second for this project based on the existing ditch, which has been out of service since the early 1900s. It is uncertain whether there will be objections to this claim under the adjudication process. There are currently significant late season water shortages lower in the drainage. Such shortages could foster water right challenges.

FINANCIAL ASSESSMENT:

The project budget includes \$28,000 for administration, \$22,000 for interest during construction, \$182,000 for engineering, \$665,610 for construction, \$10,000 for rights-of-way, \$39,936 for inflation contingencies, and \$28,426 for financing costs. Two additional project costs which the applicant separated from the total project cost include \$178,530 for land renovation (listed as in-kind from the owners) and \$26,000 for the preliminary feasibility assessment (listed as in-kind from the SCS).

A detailed cashflow analysis needs to be calculated for the project, after the cost and return estimates have been refined.

ENVIRONMENTAL ASSESSMENT:

The SCS is currently conducting an official agency environmental scoping for the proposed project. Initial comments indicate serious concern over possible damage to the cultural and historical values associated with the Big Hole Battlefield National Monument.

Further definition of the project design and related environmental concerns is needed to properly assess the merits of the project.

RECOMMENDATION AND CONTINGENCIES:

The Department recommends no funding for the project because of concerns over possible negative impacts to the Big Hole Battlefield National Monument which warrant further investigation. The recommendation is also based in part on uncertainties regarding possible objections to the project water right claim, which has not been appropriated since the early 1900s. Further analysis and documentation of project costs and returns is also needed since the project appears marginally feasible after the preliminary study.

| | |
|---|---|
| <u>APPLICANT NAME:</u> | Yellowstone County |
| <u>PROJECT/ACTIVITY NAME:</u> | Emerald Hills Water Distribution System |
| <u>AMOUNT REQUESTED:</u> | \$2,101,417 Loan |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | None |
| <u>TOTAL PROJECT COST:</u> | \$2,101,417 |

PROJECT DESCRIPTION:

Emerald Hills is a rural subdivision of 192 homes located on the outskirts of Billings southwest of the Interstate 94 and 90 junction. The proposed project will provide a water distribution system for residents of Emerald Hills where, in most cases, water is now hauled for domestic supply. Water services will be obtained from the Lockwood Water Users Association.

The Lockwood Water Users Association is a private association that currently has under construction a water treatment plant which will have as its source of supply the Yellowstone River. The Bull Pine Reservoir of the Lockwood system will provide a dependable source of supply for the Emerald Hills area. Due to a sharp change in topography, the Emerald Hills water distribution system will be divided into four different service areas or pressure zones. A pumping station will supply water from the Lockwood system to the Emerald Hills area and three pumping stations within the area will distribute water to the residents through 2-inch, 4-inch, 8-inch, and 10-inch mains.

To accomplish this project the residents of Emerald Hills propose to form a Rural Special Improvement District (RSID) for the purpose of financing construction of the water distribution system. Contractual agreements will be required between Yellowstone County and Lockwood Water Users Association to provide for care and maintenance of the distribution system. It is expected that Emerald Hills residents will become members of the Lockwood Water Users Association, in addition to creating the RSID, in order to receive water service.

TECHNICAL ASSESSMENT:

In 1986, a consulting engineering firm contracted with the Emerald Hills residents to prepare a "Master Plan for a Water Distribution System for Emerald Hills, Montana". The major emphasis of the report was to develop alternatives for distribution system layout and the associated construction costs. The Lockwood Water User's Association (LWUA) was identified as the supply source.

The LWUA is receptive to the Emerald Hills distribution system and has designed their new plant,

which will be completed in March 1987, to handle the needed expansion. The project appears to be appropriate, technically feasible, and will produce the desired effects.

The design for all improvements will be reviewed and approved by the Water Quality Bureau (WQB) of the Department of Health and Environmental Sciences before starting construction. The WQB agrees with the concept of the project.

FINANCIAL ASSESSMENT:

The total cost of the project is estimated at \$2,101,417, of which \$1,364,548 are costs of construction and contingencies and the balance is for engineering, legal review, financing, and administration. The project has a relatively high per capita cost for a water system. To finance the project the Emerald Hills residents will create an RSID and sell bonds to DNRC. Each user would have to pay \$103.50 per month to repay the loan. In addition, the monthly water service fee for LWUA is \$25.00, for a total monthly fee of \$128.50. The residents will also be required to become members of the LWUA with an initial membership cost of \$1,500, parts fee of \$39.00, and a hookup fee of \$355.00. This project is quite expensive, but the residents of Emerald Hills are willing to pay the high costs for a reliable water source.

ENVIRONMENTAL ASSESSMENT:

The only adverse impacts that will result from this project are those minor, short-term effects typically associated with construction projects. Positive effects are a reliable source of treated water available where many residents haul their domestic supply as the only option.

RECOMMENDATION AND CONTINGENCIES:

The DNRC recommends no funding for this project because of a policy adopted by the Water Development Advisory Council in December of 1984 that states at least 75% of the subdivision must be full to receive a coal severance tax bond loan.

CHAPTER III

THE RENEWABLE RESOURCE DEVELOPMENT PROGRAM

A. Program Description and History

The Renewable Resource Development Program (RRD) was established by the Montana Legislature in 1975. (Authority: Title 90 Chapter 2 M.C.A.). The law states that the purpose of the program is to "develop renewable natural resources that will preserve for the citizens the benefit of the state's natural heritage and to ensure that the quality of existing public resources such as land, air, water, fish, wildlife, and recreational opportunities are not significantly diminished by developments supported by this part." In order to do this, the Renewable Resources Development program may provide funds "for the purchase, lease, or construction of projects for the conservation, management, utilization, development, or preservation of the land, water, fish, wildlife, recreational, and other renewable resources in the state; for the purpose of feasibility and design studies for such projects; for development of plans for the rehabilitation, expansion, or modification of existing projects; and for such other and further similar purposes as the legislature may approve." Only public entities are eligible for the RRD program.

B. Program Funding

The funding source for the RRD program is the coal severance tax. Initially the program received 2.5 percent of the half of the coal severance tax revenues not allocated to the constitutional trust fund. This equalled 1.25 percent of the entire coal severance tax. During the 1981 Legislature, the law was changed by S.B. 409. This bill reallocated one-half of the RRD revenues to the new Water Development Program.

In other 1981 Legislation, H.B. 600 earmarked the RRD funds for the following project categories:

15% -- for timber stand improvement

40% -- for water development

15% -- for improvements on agricultural lands

10% -- for conservation districts for development of water reservations

20% -- for other projects the department considers important

During the 1983 Legislature, H.B. 486 allocated 15% of the RRD funds from the last category called "Other" to the "Rangeland Resource Loan Program" until 1989. This program is administered by the Conservation Districts Division of the Department of Natural Resources and Conservation (DNRC). After funding this program, five percent of the funding for the "other" category remains.

C. Program Administration and Project Review Procedures

The Montana Department of Natural Resources and Conservation administers the RRD program with procedures similar to those used for the Water Development Program. The Department develops application forms and solicits applications for the program. The applications are submitted to DNRC in the even-numbered year prior to the beginning of the Montana Legislative session. The application must include information to enable technical, environmental, economic, and financial feasibility assessments.

The Department evaluates the proposals, and also solicits technical and financial review assistance from other entities with appropriate expertise such as local, state and federal agencies, and universities.

After the project proposals are reviewed, DNRC ranks feasible projects and makes a funding recommendation for each proposal. The recommendations are presented to the Water Development Advisory Council for their consideration. The recommendations are then made to the governor who in turn makes his recommendation to the legislature. The legislature makes a final funding decision.

Once the final funding decision is made DNRC negotiates contracts with the project sponsors for project implementation. The 40% of RRD funds earmarked for water is administered as part of the water development program. Like the water development contracts, RRD contracts include a detailed scope of work defining work to be accomplished, the completion schedule, and the project budget. The disbursement of funds is coordinated with the project schedule and budget as funds are available. Contract agreements also call for quarterly and final reports, which are used in conjunction with field visits, to monitor project progress and completion.

D. Project Ranking and Funding Recommendation Procedure

The Department ranks feasible projects and develops a funding priority and funding level recommendation for the legislature. These priorities reflect the goals required by law for the use of RRD funds. These goals are:

- 1) to enhance public resources
- 2) to optimize public benefits
- 3) to promote conservation and efficient use of renewable resources

The Department and the Water Development Advisory Council have identified the following other criteria used to evaluate proposals which are that:

- 4) there is a need and urgency for the project
- 5) there is a potential for statewide application
- 6) the project has not previously received funds
- 7) agricultural preference

The results of the ranking and funding scoring for the non-water RRD applications are shown in Table 2, and written project summaries follow the table. Like the Water Development Program, the RRD program also has a \$100,000 grant limit. Applications for water-related projects (except water reservations) are reviewed and ranked under the Water Development Program criteria.

E. 1986 Grant Applications (Non-water) for Funding in FY88-89

Twenty-eight (28) applications were received for funding consideration within the four non-water categories of the RRD program. Requests were made for over \$1.7 million; however, only \$279,999 is projected to be available for these non-water projects.

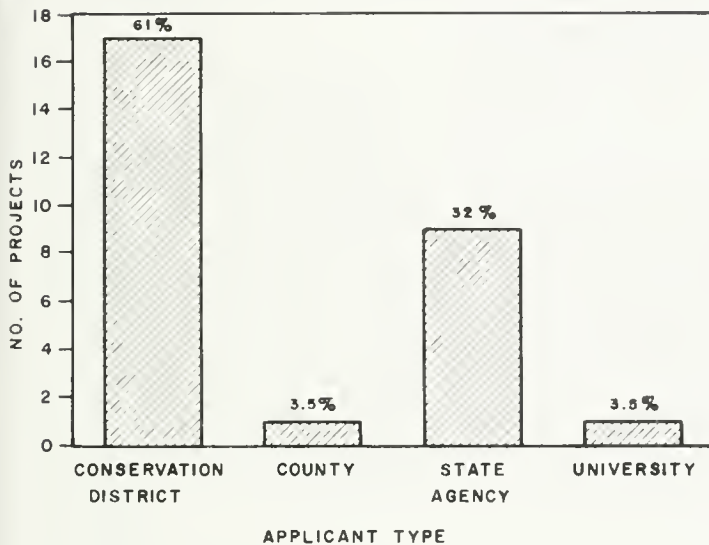
Graphs 5, 6, and 7 on the page immediately following give breakdown of the number and types of projects within the non-water RRD categories and the types of applicants that submitted grant applications. As shown on the graphs, 71 percent of the applications were for projects in the Ag Land Improvement Category. Conservation districts submitted 61 percent of the applications, and there was considerable interest in receiving grant funds for soil surveys.

Table 3, which follows the graphs, details the priority ranking and funding recommendations for non-water projects and activities. Following the table are project summaries describing each grant application received.

**1986 APPLICATIONS
RENEWABLE RESOURCE DEVELOPMENT PROGRAM
NON-WATER PROJECTS**

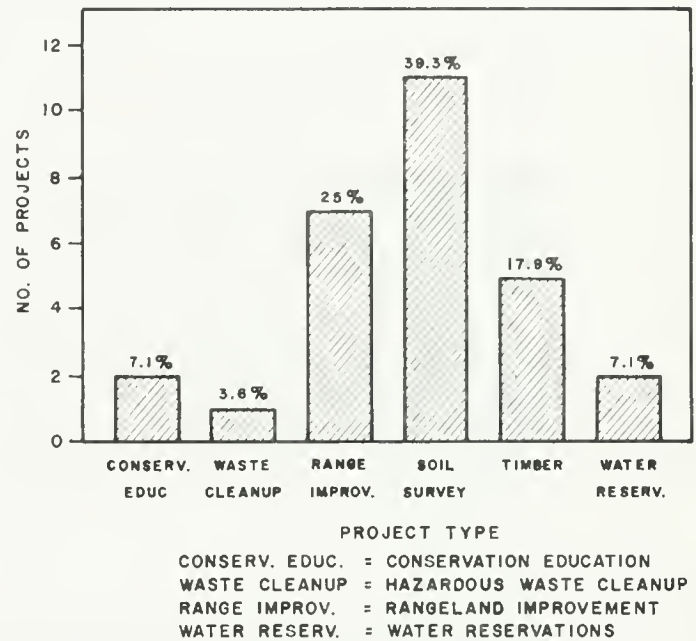
**GRAPH 5
BREAKDOWN BY APPLICANT TYPE**

28 TOTAL PROJECTS



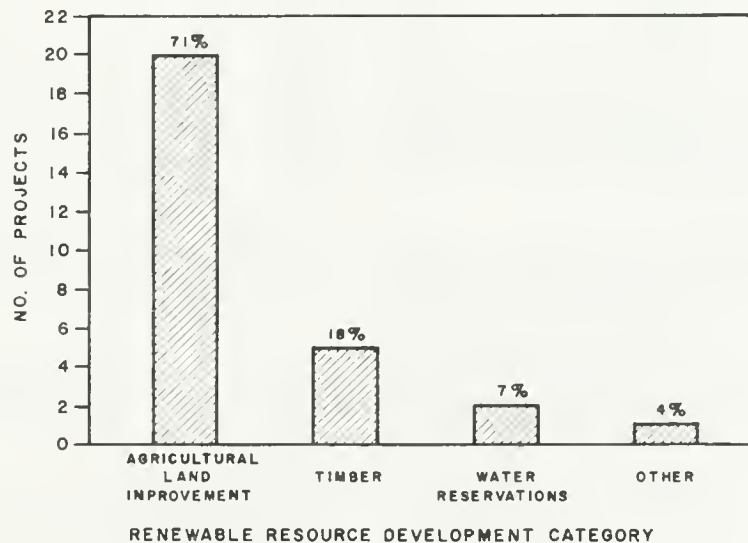
**GRAPH 6
BREAKDOWN BY PROJECT TYPE**

28 TOTAL PROJECTS



**GRAPH 7
BREAKDOWN BY RENEWABLE RESOURCE DEVELOPMENT CATEGORY**

28 TOTAL PROJECTS



Note: Percents at tops of columns represent percentage of total applications.

TABLE 3
1986 RRD RANKING AND FUNDING RECOMMENDATIONS
NON-WATER PROJECTS

| RANKING ORDER | APPLICANT NAME | PROJECT NAME | PUBLIC BENEFITS | NEED & URGENCY | STATE-WIDE APPLICATION | PREVIOUS FUNDING | TOTAL | RECOMMENDED FUNDING | CUMULATIVE TOTAL |
|---|---|---|-----------------|----------------|------------------------|------------------|-------|---------------------|-------------------------------|
| AGRICULTURAL LAND IMPROVEMENT CATEGORY | | | | | | | | | |
| 1 | DEPARTMENT OF FISH WILDLIFE & PARKS | WILDLIFE HABITAT ESTABLISHMENT | 21 | 5 | 5 | 5 | 36 | \$25,000 | \$25,000 |
| 2 | GALLATIN AND MEAGHER CONSERVATION DISTRICTS | SIXTEEN MILE RIGHT-OF-WAY REVEGETATION | 20 | 6 | 4 | 4 | 35 | \$18,405 | \$43,405 |
| 3 | DARC-CONSERVATION DISTRICTS DIVISION | COMPUTER SOFTWARE FOR TEACHING CONSERVATION | 17 | 5 | 5 | 5 | 32 | \$22,500 | \$65,905 |
| 4 | HILL COUNTY CONSERVATION DISTRICT | GRASS DRILL PURCHASE | 15 | 5 | 1 | 1 | 26 | \$8,000 | \$73,905 |
| 5 | DARC-CONSERVATION DISTRICTS DIVISION | GRAZING LANDS EDUCATION | 15 | 4 | 2 | 2 | 26 | \$10,000 | \$83,905 |
| 6 | LITTLE BEAVER CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$183,905 |
| 7 | CUSTER COUNTY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$283,905 |
| 8 | PETEROLEUM COUNTY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$383,905 |
| 9 | CHOUTEAU COUNTY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$483,905 |
| 10 | PONDERA COUNTY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$583,905 |
| 11 | EASTERN SANDERS CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$683,905 |
| 12 | LOWER MUSSELSHELL CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$783,905 |
| 13 | MILE HIGH CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$883,905 |
| 14 | CARTER COUNTY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$983,905 |
| 15 | NORTH POWELL CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$1,083,905 |
| 16 | JEFFERSON VALLEY CONSERVATION DISTRICT | SOIL SURVEY | 14 | 4 | 2 | 2 | 25 | \$100,000 | \$1,183,905 |
| 17 | DARC-CONSERVATION DISTRICTS DIVISION | ELECTRONIC SURVEY EQUIPMENT PURCHASE | 12 | 3 | 2 | 2 | 22 | \$18,621 | \$1,202,526 |
| 18 | PRAIRIE COUNTY CONSERVATION DISTRICT | CONSERVATION TILLAGE DEMONSTRATION | 10 | 4 | 2 | 2 | 21 | \$5,000 | \$1,207,526 |
| 19 | DARC-CONSERVATION DISTRICTS DIVISION | CONSERVATION TILLAGE EQUIPMENT PURCHASE | 9 | 4 | 2 | 2 | 20 | \$40,000 | \$1,247,526 |
| 20 | RUBY VALLEY & BEAVERHEAD CONSERVATION DISTRICTS | COOPERATIVE RESOURCE PROJECT | | | | | | \$0 | \$1,247,526 |
| TIMBER IMPROVEMENT CATEGORY | | | | | | | | | |
| 1 | ANACONDA-DEERLODGE COUNTY | SOIL STABILIZATION & EROSION CONTROL | 24 | 9 | 2 | 2 | 40 | \$66,854 | \$66,854 |
| 2 | MADISON CONSERVATION DISTRICT | MOBILE SAW FOR FOREST LAND MANAGEMENT | 12 | 4 | 3 | 3 | 24 | \$23,850 | \$90,704 |
| 3 | UNIVERSITY OF MONTANA | AGRO-FORSTRY PRACTICES | 12 | 4 | 4 | 4 | 24 | \$29,135 | \$119,839 |
| 4 | MONTANA DEPARTMENT OF STATE LANDS | REFORESTATION TIMBER STAND IMPROVEMENT | 14 | 3 | 3 | 3 | 27 | \$48,650 | \$168,489 |
| 5 | MONTANA DEPARTMENT OF STATE LANDS | PRECOMMERCIAL THINNING TIMBER IMPROVEMENT | 6 | 4 | 3 | 3 | 15 | \$99,953 | \$268,442 |
| WATER RESERVATION DEVELOPMENT CATEGORY | | | | | | | | | |
| 1 | LOWER YELLOWSTONE CD DEVELOPMENT COM. | FEDERAL PROJECTS AUTHORIZATION | 13 | 3 | 3 | 3 | 22 | \$16,500 | \$16,500 |
| 2 | DARC-CONSERVATION DISTRICTS DIVISION | WATER RESERVATIONS DEVELOPMENT PROGRAM | 12 | 2 | 4 | 0 | 18 | \$100,000 | \$116,500 |
| OTHER CATEGORY | | | | | | | | | |
| 1 | DEPT. OF HEALTH & ENVIRONMENTAL SCIENCES | BANBACK STATE PARK-APEX MILL WASTE CLEAN-UP | 14 | 8 | 1 | 5 | 28 | \$64,316 | \$64,316 |
| *received highest priority ranking over other soil survey applications because applicant had the largest number of requests for soil information. | | | | | | | | | |
| | | | | | | | | | ===== |
| | | | | | | | | | \$1,716,784 |
| | | | | | | | | | ----- PROJECTED FUNDING ----- |

AGRICULTURAL LAND IMPROVEMENT CATEGORY

-1-

APPLICANT NAME: Department of Fish, Wildlife and Parks

PROJECT/ACTIVITY NAME: Wildlife Habitat Establishment

AMOUNT REQUESTED: \$25,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Department of Fish, Wildlife and
Parks (DFWP), \$25,000

TOTAL PROJECT COST: \$50,000

PROJECT DESCRIPTION:

The Conservation Reserve Program of the 1985 Federal Farm Bill is designed to take highly-erodible croplands out of production and establish permanent vegetative cover on them. The cost to establish the permanent vegetation will be shared (50%) by the federal government. The purpose of this proposed project is to encourage landowners to establish suitable wildlife habitat on Conservation Reserve Program acres by cost-sharing a portion of the landowner's cost of vegetation establishment.

The availability of these state cost-share funds will be made known through Agricultural Stabilization and Conservation Service (ASCS) and Soil Conservation Service (SCS) personnel, conservation districts, direct contact with landowners and the public news media. DFWP will develop criteria for implementing this program which will include guidelines for the plant species that should be used, and limitations on funding for individual landowners. The funds will be disbursed on a first-come/first-served basis. The resulting permanent vegetation will be monitored on a yearly basis to assess planting success and use by wildlife.

TECHNICAL ASSESSMENT:

Because specific sites have not been selected for this project, it is not possible to conduct a technical assessment of this proposal. However, it is known that the establishment of permanent vegetation will result in soil conservation, abatement of soil erosion, improved water quality and wildlife habitat, and an overall healthier environment. Landowners and recreationists should jointly benefit from these improvements.

A habitat establishment incentive program developed and implemented separately from the Conservation Reserve Program would not be nearly as effective and its cost would be prohibitive.

FINANCIAL ASSESSMENT:

The proposed budget of \$50,000 will be used entirely to pay a portion of landowners' costs for establishing herbaceous vegetation and shrubs under the Federal Conservation Reserve Program. Up to 50 percent of seed cost will be paid, with a maximum of \$1,000 per landowner. For the establishment of field windbreaks/shelterbelts, 100 percent of the shrub and tree costs will be paid, up to \$1,000 per landowner. All administrative costs will be borne by DFWP.

Combining this project with the Conservation Reserve Program will save a considerable amount of money because the major share of the costs will be borne by the federal government. Of the proposed \$50,000 budget, one-half (\$25,000) will be from DFWP license dollar revenue.

ENVIRONMENTAL ASSESSMENT:

No adverse impacts will result from the implementation of this project. The establishment of vegetative cover on these highly-erodible lands will be a positive impact to the environment.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$25,000 is recommended contingent upon DNRC approval of the scope of work and budget.

APPLICANT NAME: Gallatin and Meagher County Conservation Districts

PROJECT/ACTIVITY NAME: Sixteen Mile Railroad Right-Of-Way Revegetation

AMOUNT REQUESTED: \$18,405.50 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Private Landowners - \$7,930; Gallatin and Meagher County Weed Control Districts - \$3,000

TOTAL PROJECT COST: \$29,335.50

PROJECT DESCRIPTION:

The Gallatin and Meagher County Conservation Districts will use grant funds to establish grass on approximately 90 acres within the right-of-way of the abandoned Milwaukee Railroad along a 33-mile stretch between Lombard and Ringling, Montana. The right-of-way is currently infested with Spotted Knapweed and other weeds, and the area serves as a weed seed source for adjacent land. The grass seeding will take place after the landowners complete chemical weed control efforts in the area. After revegetation occurs, follow-up spot spraying will also be conducted by the landowners to insure control, and gall flies will be released in the area to assist in continued control of the knapweed. The SCS will assist in the development of the seeding plan, will oversee and inspect the project, and work with the conservation districts on follow-up management.

The Gallatin and Meagher Weed Control Districts will provide the chemical and technical assistance necessary for weed control.

TECHNICAL ASSESSMENT:

Chemical weed control with supplementary biological control and revegetation is the preferred alternative because it results in more immediate control, provides for follow-up and future control through biological methods, and provides competition to reinfestation. The vegetation of the right-of-way will also reduce sediment impacts to Sixteen Mile Creek. The final results of this project will demonstrate an effective means of controlling problems with abandoned rights-of-way, of which Montana has many.

FINANCIAL ASSESSMENT:

Of the \$18,405.50 grant requested, \$8,140 is to purchase the grass seed and \$8,000 is for labor and equipment rental to seed and harrow the area. Contract administration and contingency costs equal the remaining \$2,265.50. Seed cost estimates were obtained from seed suppliers, and labor and equipment rental costs were based on a \$50.00 per hour rate. Funding contributions from the Weed Control Districts and the landowners are for the weed control efforts.

ENVIRONMENTAL ASSESSMENT:

Revegetation of the right-of-way areas will result in positive impacts to the environment by providing competition to noxious weed infestations, and controlling sediment to Sixteen Mile Creek. Improper use of chemical herbicides can result in adverse impacts to wildlife, fisheries, water quality, and beneficial vegetation.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$18,405 is recommended contingent on DNRC approval of the cooperative management plan and the project scope of work and budget.

APPLICANT NAME: DNRC-Conservation Districts Division

PROJECT/ACTIVITY NAME: Microcomputer Software for Teaching Soil and Water Conservation

AMOUNT REQUESTED: \$22,500 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Montana State University (MSU) Cooperative Extension Service, \$12,300

TOTAL PROJECT COST: \$34,800

PROJECT DESCRIPTION:

Grant funds awarded from this project will be used to develop computer software used to teach the principles of soil and water conservation to school children between the ages of 12 and 16 years. Other audiences such as farmers, district supervisors, SCS conservationists, university students, and school teachers will also be served.

In implementing the education program, first the degree of support from schools and their level and distribution of computer technology will be determined. Then different approaches to introducing the subject material to potential age groups will be evaluated. Using that information the computer software will be developed along with a specific program for promoting, distributing, and using the software educational package. Lastly, an evaluation system will be conducted to determine the use and success of the program, and to determine the need for program revisions.

TECHNICAL ASSESSMENT:

The development of this education program will be coordinated with the Agriculture in Montana Schools project and the Office of Public Instruction. It has received the support of the National Association of Conservation Districts, the United States Department of Agriculture, and the Montana Agriculture Department.

Studies have shown that soil and water resource conservation education in public schools receives only limited attention in school curricula. This innovative approach at conservation education takes advantage of the current interest and excitement among school-age children about computers by combining that interest with conservation education.

FINANCIAL ASSESSMENT:

The \$22,500 grant request covers a graduate student's stipend and travel costs, as well as necessary supplies for developing computer software. The Cooperative Extension Service contribution of \$12,300 covers the cost of faculty supervision and quality control.

Using a graduate student under supervision by a university education specialist will be much more cost-effective than hiring the work done by a private consultant. All cost estimates were developed using standard MSU rates.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse environmental impacts from the implementation of this project. Positive results may occur as a result of increased awareness of soil and water conservation practices and principles.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$22,500 is recommended contingent on DNRC approval of the scope of work and budget.

APPLICANT NAME: Hill County Conservation District

PROJECT/ACTIVITY NAME: Grass Drill Purchase

AMOUNT REQUESTED: \$16,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Hill County Conservation District (in-kind) - \$4,340.00

TOTAL PROJECT COST: \$20,340

PROJECT DESCRIPTION:

Hill County Conservation District proposes to purchase a grass drill to be used for seeding permanent vegetation on acreage contracted under the USDA Conservation Reserve Program and for renovating rangelands and pasture. Grasslands will be renovated by seeding grass directly into chemically pre-treated tame and native sod conditions. The district will purchase the drill and make it available to cooperators on a rental fee per-acre basis. The district will maintain the drill and schedule its distribution to users.

TECHNICAL ASSESSMENT:

The district proposes to purchase a 24-foot folding Great Plains Drill. The District has experience in the administration of district-owned equipment. They own an older Brillion Grass Drill and recently received a grant from the House Bill 223 program for the purchase of a Haybuster 8000 no-till drill.

FINANCIAL ASSESSMENT:

Bids for the grass drill were solicited from seven equipment dealers. A \$20,000 bid for a 24-foot Great Plains Drill was most satisfactory.

The District plans to charge a fee of \$5.00 per acre or less. This will cover only maintenance costs on the drill. The district should consider charging a higher fee to cover future replacement costs of the drill.

The District is currently at the maximum 1-1/2 mill assessment level.

ENVIRONMENTAL ASSESSMENT:

Establishing permanent grass on highly marginal cultivated cropland may result in positive environmental effects such as reduced soil and water erosion, less potential for saline seep development, improved soil structure and tilth, and a greater amount of wildlife habitat.

RECOMMENDATION: AND CONTINGENCIES:

A grant of up to \$8,000 (50% of the grant request) is recommended contingent on DNRC approval of the project scope of work and budget. DNRC suggests that Hill County Conservation District charge a high enough rental fee to cover replacement costs as well as maintenance costs and scheduling charges.

APPLICATION NAME: Department of Natural Resources and Conservation (DNRC),
Conservation Districts Division

PROJECT/ACTIVITY NAME: Grazing Lands Education

AMOUNT REQUESTED: \$15,000

OTHER FUNDING SOURCES
AND AMOUNTS: DNRC - \$1,960; Montana State University (MSU) - \$3,250

TOTAL PROJECT COST: \$20,210

PROJECT DESCRIPTION:

The purpose of the project is to increase the understanding of grazing lands by the public, ranchers, and land managers through increased educational opportunities. Grant funds will be used to build two grazing land simulators which depict the ecology of grazing lands on an interactive computer. The simulators will be used by over 1,500 students per year as well as thousands of adults who attend functions where the simulators are displayed. Grant funds will also be used to pay for the reprinting and updating of 500 copies of the Montana Rangeland Resource Program book, and 500 copies of range leader information packets. Sub-grants will be given to conservation districts who host the annual Montana Grazing Seminar to reduce costs charged to individuals who attend the seminars.

TECHNICAL ASSESSMENT:

Rangelands and grazeable woodlands cover about 70 percent of Montana, and grazing is the largest use of land in the state. Understanding the value of this resource and its management is essential for those who deal with grazing lands. The use of grazing land simulators can be valuable in increasing the understanding and awareness of the importance of rangelands. MSU has four simulators that are in constant use; the demand far exceeds the supply. The Conservation Districts Division (CDD) proposes to contract with MSU to build two more simulators for statewide use by conservation districts, range committees, schools, and civic groups. These simulators will be available for use upon request. Training workshops for simulator use will be conducted jointly by CDD and MSU.

The Montana Rangeland Resources Program book, which was last printed in 1977, explains the statewide Rangeland Resource Loan program in detail. The book is now antiquated and needs to be revised. The supply of the current edition has been exhausted since 1982 and hundreds of requests for the book have not been filled. All revisions and prepublication review will be done by CDD staff. Grant funds will be used only for publication costs.

The range leader information packet contains program ideas, and implementation guides that are used by county range leaders to implement county rangeland resource programs. The 10-12 page packet will be revised by CDD staff and grant funds will be used to print the packet and distribute it to range leaders, conservation districts, and others.

A portion of the funds will be used to assist a conservation or county range committee in sponsoring the annual Montana Grazing Seminar. In the past, the host districts have charged from \$30 to \$40 per individual for registration for the seminar. If the cost can be reduced for those attending, more people may attend and receive information on grazing lands.

FINANCIAL ASSESSMENT:

Of the \$15,000 grant requested, \$8,000 will go to MSU for the grazing land simulators, and \$2,000 will be for associated training materials, workshop, and equipment transport. Printing 500 copies of the Rangeland Resource Book and Range Leader Packets will cost \$3,000, and \$2,000 will offset the cost of two Montana Grazing Seminars.

The CDD does not charge individuals or groups for the publications and they are unable to pay for the publications out of their Rangeland Resource Loan Program.

Cost estimates for the simulators are reasonable.

Costs per person for attending the grazing seminar with the grant subsidy is not known.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse environmental impacts from this project.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$10,000 is recommended contingent on DNRC approval of the project scope of work and budget. The funds are to be used only for the grazing lands simulator and training portion of the proposal.

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| <u>APPLICANT NAME:</u> | Little Beaver Conservation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Fallon County Soil Survey |
| <u>AMOUNT REQUESTED:</u> | \$100,000 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Soil Conservation Service (SCS) - \$15,000 |
| <u>TOTAL PROJECT COST:</u> | \$115,000 |

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Fallon County. In the last three years Fallon County has received approximately 400 requests for soil survey information. Often these requests cannot be met because there are 1,510,520 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 6.6% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Fallon County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Fallon County by 6.6%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

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APPLICANT NAME: Custer County Conservation District
PROJECT/ACTIVITY NAME: Custer County Soil Survey
AMOUNT REQUESTED: \$100,000 Grant
OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000
TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Custer County. In the last three years Custer County has received approximately 200 requests for soil survey information. Often these requests cannot be met because there are 1,864,430 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 5.4% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Custer County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Custer County by 5.4%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Petroleum County Conservation District

PROJECT/ACTIVITY NAME: Petroleum County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Petroleum County. In the last three years Petroleum County has received approximately 40 requests for soil survey information. Often these requests cannot be met because there are 1,600,240 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 6.25% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Petroleum County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Petroleum County by 6.25%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Chouteau County Conservation District

PROJECT/ACTIVITY NAME: Chouteau County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Chouteau County. In the last three years Chouteau County has received approximately 180 requests for soil survey information. Often these requests cannot be met because there are 1,330,000 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 7.5% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Chouteau County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Chouteau County by 7.5%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Pondera County Conservation District

PROJECT/ACTIVITY NAME: Pondera County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Pondera County. In the last three years Pondera County has received approximately 300 requests for soil survey information. Often these requests cannot be met because there are 557,000 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 18% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Pondera County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Pondera County by 18%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Eastern Sanders County Conservation District

PROJECT/ACTIVITY NAME: Sanders County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Sanders County. In the last three years Sanders County has received approximately 60 requests for soil survey information. Often these requests cannot be met because there are 882,415 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 11% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Sanders County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Sanders County by 11%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Lower Musselshell Conservation District

PROJECT/ACTIVITY NAME: Musselshell County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Musselshell County. In the last three years Musselshell County has received approximately 130 requests for soil survey information. Often these requests cannot be met because there are 1,600,240 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 6.25% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Musselshell County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Musselshell County by 6.25%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Mile High Conservation District

PROJECT/ACTIVITY NAME: Silver Bow County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Silver Bow County. In the last three years Silver Bow County has received approximately 22 requests for soil survey information. Often these requests cannot be met because there are 907,700 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 11% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Silver Bow County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Silver Bow County by 11%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Carter County Conservation District

PROJECT/ACTIVITY NAME: Carter County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Carter County. In the last three years Carter County has received approximately 300 requests for soil survey information. Often these requests cannot be met because there are 1,010,320 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 9.9% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Carter County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Carter County by 9.9%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: North Powell Conservation District

PROJECT/ACTIVITY NAME: Powell County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Powell County. In the last three years Powell County has received approximately 28 requests for soil survey information. Often these requests cannot be met because there are 589,330 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 17% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Powell County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Powell County by 17%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Jefferson Valley Conservation District

PROJECT/ACTIVITY NAME: Jefferson County Soil Survey

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$15,000

TOTAL PROJECT COST: \$115,000

PROJECT DESCRIPTION:

The applicant requests a \$100,000 grant to be used to accelerate the soil survey being conducted by the Soil Conservation Service (SCS) in Jefferson County. In the last three years Jefferson County has received approximately 108 requests for soil survey information. Often these requests cannot be met because there are 907,700 acres in the county that have not been surveyed. Because of federal funding cutbacks to the current SCS Soil Survey Program, soil surveys in Montana are not expected to be completed for at least 20 to 50 years. If this grant is awarded, 100,000 acres, or approximately 11% of these remaining acres will be surveyed.

TECHNICAL ASSESSMENT:

Grant funds would be used to hire two soil scientists to work with the SCS on the Jefferson County Soil Survey. Information provided by the survey will be used for a variety of purposes including but not limited to cropland and rangeland management, water resource management, land-use planning and development, and site selection for building construction, roads, and waste disposal facilities. Without having the information provided by the soil surveys, inaccurate land-use planning and management decisions could be made which could have substantial adverse impacts to natural resources. However, this grant will only increase the number of acres surveyed in Jefferson County by 11%. Without the grant the SCS will likely still conduct the soil surveys, but it could take as long as 50 years or more before the surveys are complete.

FINANCIAL ASSESSMENT:

The applicant will use the grant funds to hire two soil scientists for two years at a cost of \$76,000. The applicant will use \$4,000 to administer the grant, \$11,000 for vehicle lease, \$1,000 for field equipment, and \$8,000 for survey operating expenses. The SCS will contribute \$15,000 for office space, clerical assistance, training, materials, phone, postage, utilities, and supplies. Cost estimates appear realistic.

No long-term funding sources have been identified to assist in accelerating the completion of the surveys.

ENVIRONMENTAL ASSESSMENT:

There will be no adverse impacts from this project. Use of soil survey information can help prevent poor land-use management decisions.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget. Funds will not be disbursed to the project unless there are at least enough available to provide full funding for one soil scientist for a two-year period.

APPLICANT NAME: Department of Natural Resources and Conservation/ Conservation Districts Division

PROJECT/ACTIVITY NAME: Electronic Surveying Equipment Purchase

AMOUNT REQUESTED: \$37,241 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Soil Conservation Service (SCS) - \$7,400

TOTAL PROJECT COST: \$44,641

PROJECT DESCRIPTION:

The Conservation Districts Division (CDD) requests grant funds for the purchase of two Geodimeter 136 surveying instruments equipped with Geodat Data Recorders. The instruments will be loaned by the CDD to local conservation districts through area offices of the Soil Conservation Service.

The SCS now has two Geodimeters based in the state office for use statewide. Both instruments are heavily used, with demand exceeding the availability. The current SCS budget does not allow for the purchase of additional Geodimeters for use in Montana.

With the purchase of two additional Geodimeters, each of the four SCS area offices will be able to house an instrument and coordinate its use among the conservation districts within the area. Since the SCS is the primary source of technical assistance to the conservation districts, the CDD would enter into a cooperative agreement with the SCS for use and maintenance of the instruments. The SCS presently has the computer compatibility necessary for use of the electronic surveying system in each area office. They also have trained personnel available to operate and care for the equipment.

TECHNICAL ASSESSMENT:

The Geodimeter is a computerized surveying instrument that uses infrared light to make readings rather than the visual readings used in a conventional surveying transit. Field readings are collected in an automatic data recorder called a Geodat.

The application states that the Geodimeter can cut up to 75 percent from the time needed for field data gathering and up to 90 percent can be saved in the time required for computation, mapping, or drawing cross sections. The data in the Geodat is entered into a computer which makes all the computations, plot maps, cross sections, or prints all the coordinates. A project requiring two-and-a-half weeks of drafting time would take about 14 minutes using data gathered in the field with the electronic surveying system.

The system will be used in the surveying and design of all conservation projects in which the SCS and conservation districts become involved.

FINANCIAL ASSESSMENT:

The total cost of the equipment purchase is \$37,241. The SCS has agreed to provide funding for maintenance, insurance, batteries, and chargers, estimated to be about \$7,400 over a ten-year period.

The CDD estimates that with the savings in time and labor associated with the use of this equipment, perhaps 30 to 50 percent more assistance will be available for the design and application of conservation practices statewide.

ENVIRONMENTAL ASSESSMENT:

The purchase and use of the electronic surveying equipment will have no direct environmental impact. However, if the equipment allows more conservation practices to be applied to the land and resources, the environmental effect should be beneficial.

RECOMMENDATION AND CONTINGENCIES:

A grant of 50% of the purchase price of each instrument package up to a maximum of \$18,621 is recommended for the purchase of two instruments, contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Prairie County Conservation District

PROJECT/ACTIVITY NAME: Conservation Tillage Demonstration Project

AMOUNT REQUESTED: \$19,793 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Conservation District (in-kind services) - \$3,044

TOTAL PROJECT COST: \$22,848

PROJECT DESCRIPTION:

Prairie County Conservation District proposes to purchase a Haybuster 107 (20-foot) no-till grain drill. The drill will be leased to district farmers, and used to demonstrate no-till grain seedings, Conservation Reserve Program grass seedings, and deep banding of fertilizer in established alfalfa and grass stands. The district estimates the drill will be used on approximately 1,000 acres per year, at a per-acre rental fee of from \$5 to \$7. Additionally, the district plans to conduct no-till field tours annually, and increase publicity on the benefits of no-till and conservation tillage through articles in the district newsletter and local newspaper.

TECHNICAL ASSESSMENT:

The advantages and disadvantages of reduced or no-tillage farm operations are fairly well-known. They have been discussed in various farm publications and promoted by the United States Department of Agriculture and agricultural researchers for several years. No-till drills have recently become quite common in Montana and their use has been demonstrated in many parts of the state by individual farmers, conservation districts, experiment station personnel, and agricultural chemical companies. Two operators in Prairie County own no-till drills; one of them makes the drill available on a rental basis.

Quite a number of conservation districts presently have no-till drills available for lease. The district owns a rangeland grass seeder, but has not been able to obtain DNRC-Conservation District Division 223 funds for the purchase of this no-till drill.

FINANCIAL ASSESSMENT:

The grant request includes the bid price of \$18,500 for the drill plus a 6% inflation contingency figure of \$1,293, for a total of \$19,793. The District anticipates a rental fee of from \$5 to \$7 per acre on an estimated 1,000 acres for a gross return of \$5,000 to \$7,000 per year.

Other possible funding options:

1)Prairie County Conservation District is receiving the maximum 1-1/2 mill assessment which generates \$4,356 per year. A special project area under conservation district law would allow the assessment of an additional 1-1/2 mills which could be used for debt retirement on the purchase of a drill.

2)The district may be able to secure a loan from a local lending institution for purchasing the drill. Anticipated rental charges could then be used to repay the loan.

3)Groups of farmers may be able to collectively purchase the drill for their own use.

ENVIRONMENTAL ASSESSMENT:

The district anticipates that greater acceptance and practice of reduced/no-till farming practices will result in decreases in soil erosion, less sedimentation, improvement in water quality, improved wildlife habitat, and energy conservation by on-farm fuel savings.

RECOMMENDATION AND CONTINGENCIES:

A grant of 25% of the purchase price of the no-till drill up to a maximum of \$5,000 is recommended contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Department of Natural Resources and Conservation/ Conservation Districts Division

PROJECT/ACTIVITY NAME: Conservation Tillage Equipment Purchase

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Conservation Districts Division (CDD) (in-kind) - \$5,000

TOTAL PROJECT COST: \$105,000

PROJECT DESCRIPTION:

The CDD requests a \$100,000 grant which will be used to help ten conservation districts with the purchase of no-till grain drills with grass-seeding capabilities. A conservation district (CD) will be able to apply for a grant of up to \$10,000 to assist in the purchase of the drill only. Each successful district applicant would be required to provide the necessary operation and maintenance costs.

TECHNICAL ASSESSMENT:

Conservation districts throughout the state have recently purchased fourteen no-till drills with grant money provided by the House Bill 223 program administered by the CDD. Based upon information from the CDD, approximately 12,000 acres have been no-till seeded with drills owned by CDs.

FINANCIAL ASSESSMENT:

The average cost to a CD for the purchase of a no-till drill ranges from \$15,000 to \$17,000, depending on drill size and model. The CD may charge from \$2 to \$4/acre up to \$12 to \$15/acre for use of the drill. The higher rental fees include tractor and operator. It is assumed the drill would be used on approximately 1,000 to 1,200 acres per year in a given CD. The CD will be responsible for scheduling the use of the drill and for all operation and maintenance.

Based upon these assumptions, it may be possible for CDs to borrow loan funds for the purchase of the drill and use rental fees for loan repayment. Another alternative would be for farmers to cooperatively purchase a drill or for one or two farmers who own the drill to make it available on a rental basis. CDs may also consider forming special project areas which would allow an additional 1-1/2 mill assessment which could be used for drill or other equipment purchase.

ENVIRONMENTAL ASSESSMENT:

It has been documented that no-till or minimum tillage will result in decreased rates of soil erosion from both wind and water. Many no-till systems are dependent upon increased chemical usage for fertilization and weed and pest control. The long-term environmental effects of increased chemical usage have not been fully evaluated.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$40,000 which may be used to provide funds to individual CDs to cover 25% of the purchase price of a conservation tillage drill, up to a maximum of \$4,000 per district.

The grant is contingent on DNRC approval of the project scope of work and budget.

APPLICANT NAME: Ruby Valley and Beaverhead Conservation Districts

PROJECT/ACTIVITY NAME: Cooperative Resource Project to Promote Irrigation Water Management and Conservation Tillage

AMOUNT REQUESTED: \$30,290 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Conservation Districts - \$1,250; Soil Conservation Service (SCS) in-kind (equipment loan) - \$13,100; SCS in-kind (Technical Assistance) - \$21,907; No-till Drill Lease (1,000 acres) - \$12,000

TOTAL PROJECT COST: \$78,547

PROJECT DESCRIPTION:

Beaverhead and Ruby Valley Conservation Districts are cooperating in a program to demonstrate and promote reduced soil erosion through no-tillage management and improved irrigation water management efficiencies. The SCS and conservation district personnel will select and establish a total of twelve demonstration plots for no-till, identify twelve cooperators for evaluating existing irrigation practices, and select two demonstration plots for appropriate irrigation water management. Field tours and educational information will be prepared for the benefit of district cooperators in both counties.

Approximately two-thirds of the grant will be used to employ a temporary part-time field technician who will be responsible for the program. This includes providing assistance in establishing the demonstration plots, selecting cooperators, monitoring and collecting project data, conducting field tours, and preparing educational information.

The two conservation districts have applied for funding jointly to cut administrative costs and to jointly employ the part-time agronomist.

TECHNICAL ASSESSMENT:

Soil erosion caused by tillage practices and inefficient and wasteful irrigation practices are serious problems in these two conservation districts. Greater use of no-till or reduced tillage cultural practices and improvements in the timing and measurement of irrigation application could effectively reduce these problems.

Both conservation districts have access to no-till grain drills. The districts will purchase irrigation water- and soil-moisture measuring equipment with the grant funds requested.

A project duration of two years is planned. Realizing that two field seasons is a short time to obtain meaningful cost and yield data, the districts received a grant from House Bill 223 funds which have enabled them to initiate the no-till management portion of the program one year earlier than anticipated.

FINANCIAL ASSESSMENT:

The conservation districts received a 223 grant of \$10,000 for the 1986 field season. The grant will not affect the project budget as it will simply extend the project duration for one year. The SCS will be providing a total of \$34,907 through in-kind services. The lease of the districts' no-till drill at \$12/acre will generate an additional \$12,000 for the project.

ENVIRONMENTAL ASSESSMENT:

Reduced soil erosion caused by wind and water could be a positive result of this demonstration project. Improved irrigation water management could reduce irrigation return flows, resulting in less water quality degradation from irrigation diversions.

Increased use of agricultural chemicals generally associated with no-till may have adverse environmental impacts.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends no funding for this project. Although DNRC strongly supports improved irrigation water management and reduced tillage practices for soil erosion control, it is felt that establishment of demonstration plots for promotion of these practices is less effective than touring farms where these practices are being used, and the farmer's personal experience can be emphasized. Additionally, both CDs now make no-till drills available to district cooperators; therefore, the concept of no-till management is beyond the demonstration phase.

It should be noted that in the past other CDs involved with no-till field demonstrations have not hired staff to establish and coordinate the field demonstrations as is proposed with this project.

TIMBER IMPROVEMENT CATEGORY

- I -

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| <u>APPLICANT NAME:</u> | Anaconda-Deer Lodge County |
| <u>PROJECT/ACTIVITY NAME:</u> | Anaconda Soil Stabilization and Erosion Control |
| <u>AMOUNT REQUESTED:</u> | \$66,854 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Soil Conservation Service (SCS) - \$4,000 |
| <u>TOTAL PROJECT COST:</u> | \$70,854 |

PROJECT DESCRIPTION:

In the late 1800s and early 1900s, the Anaconda Copper Mining Company used wood extensively in its refining process; most of the timber in the local area was harvested. The removal of existing vegetative cover, combined with heavy metal pollution in the soils from smelting activities, and a harsh climate inhibited the reestablishment of a natural ground cover. After the harvesting operations, major soil erosion problems occurred. One area that developed the most severe soil loss problems was the area known as the "A" and "C" hills, adjacent to the city. (The "A" and "C" hills were recently deeded to the city-county government from the Anaconda Company.)

Without the benefit of a vegetative cover, from twelve to fourteen inches of soil has been lost over the entire area. The SCS has estimated that between 13 to 40 tons per acre per year are being lost to erosion.

This erosion magnitude, in conjunction with a lack of ground cover, has caused flooding damage to homes and yards in Anaconda. The local government has also had problems with excessive sediment plugging storm drains and causing damage to roads. The applicant proposed to use the grant funds to continue ongoing tree planting and revegetation efforts in the area. Approximately 40,000 trees will be planted, and 30 acres will be planted in grass and shrubs.

TECHNICAL ASSESSMENT:

The problem has been well-defined and documented. A variety of tree and shrub seeds are obtained on a yearly basis and are being grown in the state nursery to insure adequate seed stock. All soil analysis, soil surveys, and site selections have been completed, and planting procedures for trees and shrubs have been developed. Technical assistance was provided by the SCS. Past revegetation efforts have been successful in establishing ground cover and reducing sediment impacts. This project accelerates revegetation projects that have been ongoing for several years. Of an approximate 600-acre project area, 263 acres will have been planted by 1988. These grant funds will cover an additional 215 acres, leaving 122 acres or 20% of the area yet untreated.

FINANCIAL ASSESSMENT:

Of the \$66,854 requested, \$8,760 is for professional salaries for the planting supervisors and secretary; \$2,500 is for associated administrative costs. Labor costs total \$27,000; equipment and materials, \$20,100; contingency and inflation add \$8,494 to the cost. All costs are based on past planting activities.

The applicant will provide the salary for the contract administrator and office supplies. The SCS contribution is in the form of in-kind services.

Previous DNRC contributions to this reforestation project include \$150,000 in Resource Indemnity Trust (RIT) grant funds, and \$16,000 from the Conservation Districts Division 223 funds.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts are anticipated from this project. The stabilization of the hillsides will reduce a significant sediment source to Warm Springs Creek, a tributary of the Clark Fork River, increase wildlife habitat, and reduce erosion problems within the community of Anaconda.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$66,854 is recommended contingent on DNRC approval of the project scope of work and budget.

The project is also being considered for funding under the Resource Indemnity Trust (RIT) grant program. If RIT grant funds are approved and available for this project, Water Development grant funds will not be used.

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| <u>APPLICANT NAME:</u> | Madison Conservation District |
| <u>PROJECT/ACTIVITY NAME:</u> | Mobile Saw for Forest Land Management |
| <u>AMOUNT REQUESTED:</u> | \$23,850 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | Madison Conservation District - \$275 |
| <u>TOTAL PROJECT COST:</u> | \$24,125 |

PROJECT DESCRIPTION:

The Madison Conservation District proposes to use grant funds to purchase a mobile saw and implement a forestry management program on approximately 2,000 acres of private forest land in Madison County. The area includes timbered area from the valley bottom to the higher forested U.S. Forest Service lands between Ennis and Norris, Montana.

Forest Management planning will be provided to landowners through the Resource Conservation and Development (RC&D) forester, the Department of State Lands (DSL) forester, and the Soil Conservation Service (SCS) field personnel. Timber harvest will be carried out by the landowner with his own equipment and labor, or with hired help. The Conservation District will assist the landowner in advertising for, and obtaining the necessary labor. Harvest layout assistance will be available through the Conservation District, by the RC&D forester, DSL forester, or through a private consultant.

With funds provided under the grant, the Conservation District will have a mobile sawmill and a trained operator available for use by private landowners. A lease agreement between the Conservation District and the landowner will be signed prior to beginning processing of the lumber. The saw will be taken to the recently-harvested area, where the lumber will be processed. The landowner will be charged a fee for both the equipment and labor.

The disposal of all timber products produced and the use or sale of these products will be entirely the responsibility of the landowner. The Conservation District will maintain current lists of potential outlets and provide these to the landowner, along with recommendations on marketing.

The Conservation District will conduct two timber management workshops, and one tour each year for the first two years of the program. A report on the cost and returns of the program will be developed and made available to interested parties.

TECHNICAL ASSESSMENT:

Since these tracts are scattered and isolated from the major sawmill markets, and contain relatively small volumes of sawlog timber, major forest product producers find such areas less desirable than large tracts with high timber volumes per acre, and view them as uneconomical for harvest. Implementation of the proposal could enhance the quality and productivity of the forest in the project area by making it possible to harvest excess trees. Manufacturing of the excess trees into posts, poles, rails, and rough lumber makes this resource more available to local people, satisfying their need for a local source of rough lumber and fencing materials. This program is similar to one that is being carried out in the states of Florida, Georgia, and North Carolina.

Reviewers suggest that management plans be written before the actual timber management occurs. They also express concern that there is not a documented commitment from the landowners to use the saw at a level that will allow the program to be cost-effective to the district.

FINANCIAL ASSESSMENT:

The grant request is only for the initial start-up costs and limited administrative costs incurred during the early stages of the project. Once in operation, the program is designed to be self-supportive.

All costs were established with the aid of marketing specialists from the DSL, U.S. Forest Service, the RC&D forester, and information from similar programs in Florida and South Carolina. The lease agreement is patterned after the Florida agreement.

Due to the long-term nature of the project, no attempt has been made to identify the amount of in-kind assistance that will be provided by the SCS, DSL, or the Conservation District. Also, total costs the landowners will incur as a result of the timber harvest layouts, harvest, or lumber processing has not been estimated. Agricultural Stabilization and Conservation Service cost-share is available for some of the practices to be carried out. This additional funding has not been identified in the proposal due to the long-term nature of the program.

Of the \$23,850 project cost, \$14,000 is for the purchase of the mobile saw and trailer and associated equipment. Costs for administering the program total \$3,000 and liability insurance is estimated to cost \$5,000. Travel costs are \$500 and \$1,350 is provided for contingency.

ENVIRONMENTAL ASSESSMENT:

Because no specific sites are identified for timber harvesting, it is not possible to determine if adverse environmental effects will occur. Best Management Practices will be used to minimize impacts.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$23,850 is recommended contingent on the applicant providing documentation that there is enough interest from landowners to use the saw to make the program self-supporting, and contingent on DNRC approval of the project scope of work and budget.

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| <u>APPLICANT NAME:</u> | University of Montana |
| <u>PROJECT/ACTIVITY NAME:</u> | Agro-Forestry Practices for Ponderosa Pine Lands |
| <u>AMOUNT REQUESTED:</u> | \$58,962 Grant |
| <u>OTHER FUNDING SOURCES AND AMOUNTS:</u> | University of Montana (UM) - \$30,000 |
| <u>TOTAL PROJECT COST:</u> | \$88,962 |

PROJECT DESCRIPTION:

The Mission-Oriented Research Program at the University of Montana was established by the legislature in 1981 to study management treatments for improving the multi-resource productivity of second-growth forest lands in Montana. A summary of needs was completed in 1982. This report emphasized the need to look at silvicultural treatments in young stands, and to determine forage production practices and potentials of forested range. Experiments were established at Lubrecht Experimental Forest in 1982-1983 to study the effects of site, species, and density on wood production. Studies on forage production were also installed in these same stands. After three years, the forage production yielded several times as much forage and of higher quality than natural (untreated) conditions. Since these treatments were developed and demonstrated only at Lubrecht, it is now essential to demonstrate them in other climatic regions to determine which practices are most appropriate.

This project will demonstrate the beneficial effects of applying preferred timber management and forage improvement treatments to increase grazing capacity without harming other resources. The implementation will be carried out by coordinated planning between the Forestry Division of the Department of State Lands (DSL), UM and the Cooperative Extension Service (CES). The UM will be responsible for planning, installing, and monitoring the demonstration areas and for reporting of results in terms of wood and forage production and costs of management treatments. The CES will assist in coordination of workshops and training sessions to provide maximum transfer of knowledge to citizen and agency groups interested in practicing effective agro-forestry practices. The DSL will use the area as part of their Service Forestry program.

TECHNICAL ASSESSMENT:

The project will be accomplished by selecting stands in two geographic regions. Two densities will be established by whole-tree thinning techniques: 1) 220 trees/acre, and 2) 110 trees/acre. A clearcut and an untreated area will also be included for comparison purposes. Each demonstration area will be eight acres in size, of which six acres will be thinned or harvested. The thinned areas will be split to allow demonstration and comparison of forage improvement practices, including prescribed burning and sowing of highly productive forage species best adapted to each regional climate. A grazing/non-grazing treatment may also be applied. Forage production will be monitored annually for the first three years and periodically thereafter. Tree growth will be monitored at five-year intervals. No specific sites have yet been identified.

The areas will serve as long-term demonstration areas where ranchers, woodlot owners, and foresters may see the short- and long-term results of beneficial agro-forestry practices. They will be useful for DSL foresters who wish to show what different treatments will look like once implemented. They will be used by UM to obtain long-term data for improving management prescriptions and practices. They will also provide the basis for forestry and agriculture extension reports to the general public. The CES will utilize the areas for field workshops and as self-guided tour areas for a wide variety of groups.

FINANCIAL ASSESSMENT:

The initial demonstration and measurement costs will be partially covered by the DNRC grant. The planning, monitoring, and dissemination of results will be paid for by the UM at a cost of \$30,000.

Of the \$88,962 total project cost, \$34,865 is for professional salaries and benefits and \$8,750 is for travel and office supplies. Equipment rental and field supplies and materials total \$5,520. Indirect costs to the University of Montana add \$9,827 to the total project cost.

Because specific sites and work details have not been outlined, it is not possible to determine the cost-effectiveness of the proposed budget.

ENVIRONMENTAL ASSESSMENT:

The project should have favorable environmental impacts if timber managers are stimulated to carry out recommended "best management practices" on their own land.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$49,135 is recommended contingent on DNRC approval of the project scope of work and budget.

The \$49,135 figure was reached by subtracting the \$9,827 of indirect costs charged by the University of Montana from the \$58,962 grant request.

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APPLICANT NAME: Department of State Lands

PROJECT/ACTIVITY NAME: Reforestation Timber Stand Improvement

AMOUNT REQUESTED: \$48,650 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Department of State Lands (DSL) - \$4,472

TOTAL PROJECT COST: \$53,122

PROJECT DESCRIPTION:

The Montana Department of State Lands (DSL) requests funding for reforestation treatments on six areas of state-owned land. These treatments are a part of normal forest operations. The plantings will reestablish timber stands on some of the more productive state forest land sites after they are harvested in 1986-1988. Harvested areas will be planted with a sufficient number of seedlings to fully occupy the growing sites.

TECHNICAL ASSESSMENT:

The project involves reforesting after harvesting 270 acres of highly-productive land and 118 acres of moderately-productive land at an average cost of \$126 per acre. No innovative reforestation methods are proposed; however, if prompt planting after harvest does not occur, competing vegetation is likely to become a significant hindrance to future regeneration. Harvesting of these areas will occur regardless of whether these funds are available, but reforestation will not occur if RRD funds are not available. The proposed treatments will utilize the contracted services of professional forestry laborers.

FINANCIAL ASSESSMENT:

DSL will provide \$4,472 for contract administration. Of the \$48,650 grant requested, \$27,800 will be for the cost of the tree seedlings and \$20,850 will be for the planting contract. Seedling costs are based on nursery estimates and the planting contract estimates are based on previous planting project costs.

While the average cost per acre is \$126, no figures were provided for the anticipated revenue to be generated from the harvesting of the existing trees, or for future harvest.

The most highly-productive sites are Tamarack Creek, Mayo Gulch, and Spitfire. Reforestation costs for these sites are estimated at \$41,152. Less productive sites are South Dog, Swamp Cat, and Arrastra Creek. Reforestation costs for these areas are estimated at \$6,554.

Current DSL timber stand improvement funds are insufficient to finance all planned and worthwhile treatments on the forest.

The DSL received a \$100,000 RRD grant in 1983 and a \$91,000 grant in 1985 for similar projects in different locations in Montana.

ENVIRONMENTAL ASSESSMENT:

Reforestation provides a positive environmental impact in harvested areas by improving wildlife habitat and reducing the potential for soil erosion.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$48,650 is recommended contingent on DNRC approval of the project scope of work and budget. Reforestation of the Tamarack Creek, Mayo Gulch, and Spitfire areas must be funded before the South Dog, Swamp Cat, and Arrastra Creek areas.

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APPLICANT NAME: Department of State Lands

PROJECT/ACTIVITY NAME: Precommercial Thinning Timber Stand Improvement

AMOUNT REQUESTED: \$99,953 Grant

OTHER FUNDING SOURCES AND AMOUNTS: Department of State Lands (DSL) - \$24,095

TOTAL PROJECT COST: \$120,048

PROJECT DESCRIPTION:

This Renewable Resource Development (RRD) funding request is for precommercial thinning treatments on eleven areas of state-owned forest land. The treatments are a part of normal forest operations.

Precommercial thinning and sanitation consists of removing trees from overstocked stands that are creating excessive competition to selected crop trees, or contributing to disease conditions that could adversely affect growth and yield. The purpose of these precommercial thinning treatments is to accelerate the production of commercial wood products from established young stands, while maintaining or enhancing other resource values. Most existing thinning opportunities are the result of commercial harvests in the 1950s and 1960s that produced abundant regeneration but retained relatively little commercial value. These treatments may result in higher yields of commercial sawtimber and better prices per unit of yield when harvests are eventually conducted.

TECHNICAL ASSESSMENT:

This project involves thinning eleven areas covering 965 acres on moderate to good productivity sites. The existing stands range from 850 to 7,000 stems per acre; the objective is to thin to 400 stems per acre. The cost of treatment ranges from \$75 to \$229 per acre, with the average at \$129. Species involved are primarily Douglas-fir, western larch, ponderosa pine, and a small amount of lodgepole pine. The proposed treatment will use the contracted services of professional forestry laborers.

The methods proposed are normal and usual activities which have traditionally occurred on state forest land. No innovative or new methodologies are being applied or demonstrated through this proposal.

FINANCIAL ASSESSMENT:

Of the \$124,048 total project cost, \$24,095 is for treatment area preparation and grant administration, which will be funded by the DSL. The \$99,953 grant will be for the contracted services of professional foresters to carry out the thinning treatments. Cost estimates are based on costs of similar projects previously funded. No revenue estimates from the future sale of these timber resources were given. Current DSL timber stand improvement funds are insufficient to finance all planned treatments.

The Montana Department of State Lands received a \$100,000 RRD grant in 1983 and a \$91,000 grant in 1985 for similar projects in different locations in Montana.

ENVIRONMENTAL ASSESSMENT:

Unmanaged timber-producing forest lands can become infested with disease and insects, and can provide fuel for forest fires. Managing these forest resources can prevent these problems and in some cases can enhance the wildlife habitat of the area, providing long-term positive impacts to the environment.

However, in some areas conventional thinning practices can interfere with the growth of understory vegetation used for browse by wildlife and the thinned wood resources are not used, wasting a potential renewable resource.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$99,953 is recommended contingent on DNRC approval of the project scope of work and budget. The following thinning projects are in the highest productivity class and should be funded first: Hornet Creek, Goat Creek Hill, and Whitetail.

WATER RESERVATION CATEGORY

- 1 -

APPLICANT NAME: Lower Yellowstone Conservation District Development Committee (LYCDDC)

PROJECT/ACTIVITY NAME: Federal Projects Authorization

AMOUNT REQUESTED: \$33,000 Grant

OTHER FUNDING SOURCES AND AMOUNTS: LYCDDC (In-kind) - \$2,300

TOTAL PROJECT COST: \$35,300

PROJECT DESCRIPTION:

The Lower Yellowstone Conservation District Development Committee (LYCDDC) was formed in 1983 by six conservation districts in the Lower Yellowstone River Basin to pursue development of their water reservations. Through a resource coordinator, the group is conducting an on-going investigation of innovative and cost-effective methods of implementing high-lift irrigation and cooperative irrigation projects using existing canal systems. The LYCDDC resource coordinator has prepared conceptual designs and evaluations of various irrigation projects meeting these criteria. This proposal involves funding a preliminary review and evaluation of three LYCDDC projects by the Bureau of Reclamation. Those projects are the Fallon Flats, Belle Prairie, and Sidney irrigation projects.

TECHNICAL ASSESSMENT:

The proposed Bureau of Reclamation studies will be conducted at the reconnaissance level. The effort will compile existing data, conduct engineering evaluations, quantify benefits and costs, identify environmental and social issues, and review the LYCDDC analysis. The study will include three proposed projects covering 17,680 acres. Study results will be used as decision tools for project area landowners, and could be used as a basis for initiating formal consideration under the USBR programs.

The proposed Fallon Flats project is located southeast of Fallon in Prairie County. The project will result in the irrigation of 7,810 acres with an estimated benefit-to-cost ratio of 0.89 to 1.

The Belle Prairie project is located northeast of Glendive in Dawson County. The project will result in the irrigation of 4,086 acres with an estimated benefit-to-cost ratio of 1.02 to 1.

The Sidney project is located three miles west of Sidney in Richland County. The project will result in the irrigation of 5,784 acres with an estimated benefit-to-cost ratio of 0.99 to 1.

The Fallon Flats, Belle Prairie, and Sidney irrigation projects, proposed for Bureau of Reclamation review, appear marginally feasible according to current information. The applicant anticipates that consideration of towable pivots and other concepts new to federal reclamation programs will enhance project economic feasibility. Results could verify LYCDDC analysis and provide a framework for Pick-Sloan Missouri Basin Program funding.

The proposal is part of an effort by conservation districts and the State of Montana to reserve the state's water for future beneficial uses, and to show diligence in perfecting those uses as required by law to retain the reserved water rights.

FINANCIAL ASSESSMENT:

The proposed project is estimated to cost \$35,300. The budget includes \$33,000 for the Bureau of Reclamation reconnaissance studies; the LYCDDC will provide \$2,300 in in-kind services.

The Bureau of Reclamation costs could be decreased by 50% if there are available funds in the Bureau's state assistance budget for which the state authorizes use.

The LYCDDC received \$79,000 in state grants in 1983 to initiate their development efforts in six counties.

ENVIRONMENTAL ASSESSMENT:

The reconnaissance study itself has limited impact on the environment. Long-term positive impacts of irrigation development could include substantial economic enhancement of the region. Adverse impacts could include increased groundwater salinity and decreased streamflows.

The proposed investigations will identify environmental and social issues of concern for the projects studied.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$16,500 is recommended contingent on DNRC approval of the project scope of work and budget. The remaining funds required for the budget should be requested through the U.S. Bureau of Reclamation's state assistance fund.

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APPLICANT NAME: Department of Natural Resources and Conservation - Conservation Districts Division

PROJECT/ACTIVITY NAME: Water Reservation Development Program

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: None

TOTAL PROJECT COST: \$100,000

PROJECT DESCRIPTION:

The Conservation Districts Division (CDD) of DNRC requests a grant from the earmarked water reservation category under the Renewable Resource Development Program. The CDD will in turn provide funds to conservation districts upon request for preparation of water reservation applications, or for implementation of existing water reservations.

TECHNICAL ASSESSMENT:

Conservation districts (CDs) in the Yellowstone River basin, among other eligible reservants, were granted the right to put reserved water to beneficial use by the Board of Natural Resources and Conservation. These CDs were given a priority date of 1978, and have made significant progress towards developing their water reservations.

The 1985 Water Marketing Bill established a similar water reservation application process for the Missouri River basin. The Upper Missouri CDs are currently in the process of preparing their applications for water reservations. The remainder of the Missouri Basin CDs will begin preparing their applications in the near future.

Applications for financial assistance from the CDs for either preparing water reservation applications, or implementing existing reservations will be received by the CDD, reviewed in cooperation with the DNRC Water Development Bureau, and approved by the director of DNRC.

FINANCIAL ASSESSMENT:

The preparation of water reservation applications is far beyond the financial capability of conservation districts, who are limited by law to 1-1/2 mill assessments. The Renewable Resource Development Act anticipated that additional funds would be needed by conservation districts for water reservation development, and required that 10% of the available RRD funds be earmarked for such purposes.

ENVIRONMENTAL ASSESSMENT:

No environmental impact will result from the preparation of the reservation applications. Any impacts from proposed water development projects identified in water reservation applications to the Board of Natural Resources and Conservation will be fully addressed in a required environmental impact statement.

RECOMMENDATION AND CONTINGENCIES:

A grant of up to \$100,000 is recommended contingent on DNRC approval of the project scope of work and budget.

OTHER CATEGORY

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APPLICANT NAME: Montana Department of Health and Environmental Sciences

PROJECT/ACTIVITY NAME: Bannack State Park-Apex Mill Hazardous Waste Cleanup

AMOUNT REQUESTED: \$100,000 Grant

OTHER FUNDING SOURCES
AND AMOUNTS: Environmental Protection Agency (EPA) - \$100,000

TOTAL PROJECT COST: \$197,372

PROJECT DESCRIPTION:

The State of Montana became involved in Bannack in 1954 when 17 parcels of land were donated as a State Park and the town site was designated a State Monument. It is considered one of Montana's major historic sites. A significant part of the Bannack State Park is the Apex Mill. While it is in disrepair, long-range plans for the park call for the integration of the mill site with other park features for historical interpretation. However, waste materials at the Apex Mill site contain significant quantities of cyanide, arsenic, and lead. These contaminated materials are uncontained and present a potential direct contact hazard to site visitors. Additionally, erosion of and percolation through these materials may be degrading the water quality in Grasshopper Creek and nearby groundwater aquifers.

The Solid & Hazardous Waste Bureau of the Department of Health and Environmental Sciences (DHES) proposes to address these problems in three phases. First, a detailed site investigation would be conducted to identify and locate mill wastes presenting a potential hazard. Next, the hazardous waste in and around the mill will be removed and disposed at a hazardous waste disposal site.

Concurrently a site assessment of the tailings impoundment will be conducted to obtain information about impacts to Grasshopper Creek and local groundwaters. Components of the investigation will involve groundwater monitoring wells, test pits, and tailing materials sampling. Data will be used to identify remedial action that could be taken to control or eliminate adverse impacts to the water quality of Grasshopper Creek.

TECHNICAL ASSESSMENT:

Until the first part of the proposal is completed, (the detailed site investigation) it is not possible to assess the technical merits of the proposed alternative of waste removal and disposal. The applicant has indicated it will be considering other alternatives after the site investigation is complete. No specific implementation plan was presented on conducting the detailed site investigation.

The applicant has not indicated how the mill site cleanup could affect the mill building, which is a National Historic Landmark. This should be addressed in the reclamation plan developed after the site investigation is complete.

If implemented, the first two phases of the project will result in the reduction of possible health hazards to site visitors, and potential liabilities to the state. The results of the site assessment of the tailings impacts to Grasshopper Creek is a separate component and will only result in data that can possibly be used to identify remedial action for which no funding source is secured. No specific implementation details of the site assessment were provided.

FINANCIAL ASSESSMENT:

The requested \$100,000 grant will be matched by EPA funds if federal reauthorization and use of funds is approved. Budgets for each phase of the project were established based on level of effort estimates and comparison with similar projects. Costs for the mill site investigation total \$11,600. The waste removal plans, site preparation, and actual removal costs total \$89,600, and the tailings investigation costs total \$65,000. Project management personnel and administrative costs total \$20,000, and 6% inflation adds \$11,172.

This investigation of tailings impact to Grasshopper Creek could be eligible for Department of State Lands Abandoned Mine Land funding after 1989.

ENVIRONMENTAL ASSESSMENT:

No adverse environmental impacts will result from implementation of any phases of this project. Positive impacts would be the reduction of hazardous waste at the historic site, and reduction of pollutant sources to Grasshopper Creek.

RECOMMENDATION AND CONTINGENCIES:

DNRC recommends a grant of up to \$64,316 for funding only the hazardous waste cleanup at mill site. The grant is contingent on the following:

1. DNRC must approve the project scope of work and budget.
2. The final project plan must be approved by the State Historic Preservation Office and the Department of Fish, Wildlife and Parks prior to awarding any contracts for actual cleanup activities.
3. The plan must provide for a historic architect to be on-site during all phases of cleanup that could affect the mill building or its contents. The historic architect or his/her appointee will be responsible for assuring that cleanup operations do not significantly affect the integrity of the site.
4. If possible, cleanup operations should take place during periods of low recreational use.
5. EPA matching funds must be provided.
6. If Resource Indemnity Trust grant funds are approved and received for this project, these Renewable Resource Development grant funds shall not be awarded.

The \$64,316 figure was derived by dividing the total cost of the hazardous waste cleanup option of the project (\$132,372) in half, and subtracting the \$1,870 of indirect costs charged by the DHES.

CHAPTER IV

WATER DEVELOPMENT PRIVATE LOAN PROGRAM

The Private Loan Program is a part of the Water Development Program established in 1981 by the Montana Legislature to promote the beneficial use of water by private entities. These entities may be individuals, partnerships, or corporations. The maximum loan per project is \$200,000. Eligible projects and activities include those which conserve, protect, develop, store, distribute, and enhance water resources through efficient use and management. Eligible projects include but are not limited to erosion control, irrigation dam construction or repair, ditch lining or consolidation, irrigation system automation or rehabilitation, and gravity irrigation system construction.

Applications are accepted at any time, and are reviewed by the Department for completeness, eligibility, repayment ability, and adequacy of loan security. Each project must include information to determine technical, economic, and financial feasibility. The DNRC director makes the funding decision.

The Water Development Program contained authority for the DNRC to issue up to ten million dollars in Water Development General Obligation Bonds, and to use the proceeds for loans.

The 1981 Legislature started the program by designating \$350,000 of Renewable Resource Development funds for loans. In addition to the RRD funds, the following four bond sales provided proceeds for private loans:

| <u>Sale Date</u> | <u>Amount</u> | <u>Interest Rate</u> |
|------------------|---------------------|----------------------|
| October 1983 | \$ 1,300,000 | 7.20% |
| October 1984 | 900,000 | 8.71% |
| July 1985 | 1,000,000 | 7.22% |
| December 1985 | <u>\$ 1,000,000</u> | 6.92% |
| | \$ 4,200,000 | |

As of September 1986, 54 private loans have been approved. A total of \$3,314,953 has been advanced, while \$1,028,446 is committed to projects but has not yet been disbursed.

The 54 loans fund the following types of projects:

- 33 Sprinkler Irrigation Systems (9 are gravity systems)
- 7 Irrigation Canal Rehabilitation Projects
- 8 Rural Water Supplies
- 1 Streambank Stabilization Project
- 1 Irrigation Canal Weed and Moss Catcher
- 1 Gated Pipe Irrigation Project
- 1 Cablegation Irrigation Project
- 1 Irrigation Water Storage Project
- 1 Hydropower Project

The canal rehabilitation and canal weed and moss catcher projects affect 27,510 acres. The sprinkler systems, gated pipe, cablegation, and storage projects affect 7,370 acres.

CHAPTER V

DEVELOPMENT AND IMPLEMENTATION OF WATER RESERVATIONS

Background

Montana's Water Use Act, passed by the 1973 Legislature, gave public entities the unique opportunity to apply to the Board of Natural Resources and Conservation (Board) to reserve water for future beneficial uses or for protection of a minimum flow level, or quality of water.

The water reservation statute has been exercised in the Yellowstone River Basin. The Board granted water reservations to eight municipalities, fourteen conservation districts (CDs), four state agencies, two federal agencies, and one irrigation district in 1978. Currently, there are water reservation applications pending or being prepared in two other Montana basins, the Missouri and the upper Clark Fork.

Revision of the Water Reservation Rules

In anticipation of the Yellowstone reservation process, a set of administrative rules was developed roughly ten years ago. To better guide current and future reservation activities, the administrative rules governing the water reservation process were revised in September 1986 to clarify and set out in further detail the requirements for preparing applications and the role of the DNRC and Board in carrying out the process. Prior to final Board adoption of the rules in September of 1986, many valuable comments had been received from Board members and interested agencies and individuals. These groups were instrumental in refining an important addition to the rules -- a set of decision criteria the Board must address each time it makes a determination on whether to grant a water reservation. The rules, formally published in the Administrative Record on September 29, 1986, will now better guide applicants in all reservation proceedings, including the current Missouri Basin process.

Yellowstone Basin Water Reservation Proceeding

On December 15, 1978, the Board approved water reservations for present instream flow and future municipal, agricultural, and multipurpose uses in the Yellowstone River Basin. The Board specified the following priorities and amounts of water:

- First: Municipal reservations - 60,913 AF
- Second: Instream flow reservations upstream of Billings - 3,914,555 AF, measured at Billings
- Third: Irrigation reservations - 650,324 AF
- Fourth: Instream flow reservations downstream of Billings - 5,429,310 AF measured at Sidney
- Fifth: Multipurpose/Storage reservations - 1,111,000 AF

The reservations approved by the Board include 567,261 acre-feet of water per year to fourteen CDs, primarily for irrigation. To avoid speculation, the Board established specific requirements to assure due diligence in the development of these reservations. Each CD must prepare a general development plan, a detailed plan for each potential project, and an annual report. The Board is required to review these products at least every ten years to determine if the objectives of each reservation are being met. It then retains the authority to extend, modify, or revoke a reservation.

DNRC Assistance to Conservation Districts

As new reservants, the CDs soon realized they were understaffed and unable to comply with the December 15, 1981 deadline for completing the general development plans. In response, the 1979

Legislature amended the reservation statute to require the DNRC to provide administrative and technical assistance to the CDs. The DNRC hired two irrigation specialists in 1981 to serve as liaison among the districts and the Board, and to provide direct staff assistance to each CD at the local level.

To meet the Board's administrative requirements, the CDs requested and obtained an eighteen-month extension for submission of their general reservation plans to the Board. Subsequent discussions with the Board resulted in two levels of detail for reservation plans. A general reservation development plan would be required by July 1, 1983 and would include information pertinent to reservation development and administration from a general, long-term perspective. A second, more detailed plan would be required for each project before it could be developed.

The general development plans were drafted by the DNRC and approved by the CDs during the eighteen months preceding the July 1, 1983 deadline. Subsequently, these plans were approved by the Board. During this period, DNRC also prepared an evaluation of water availability in the Yellowstone River Basin which took into account the eventual development of all reserved water.

After the general development plans were approved by the Board, individuals within the CDs could begin applying to use the reserved water. The CDs require individuals to complete and submit applications for each project to the appropriate CD. After the applications are approved by the CDs they are then submitted to the Board for final approval. The DNRC assists potential applicants in preparing the detailed irrigation plans and in completing the application forms.

Use of Reserved Water

As of September 4, 1986, thirteen CDs had 74 projects authorized by the Board. These projects would use 23,088.6 acre-feet of reserved water per year. Numerous other applications are currently being processed. The following table shows the progress of CDs in developing their reserved water.

Approved Use of CD Reserved Water

| Conservation District | No. of Projects Approved | Project Water Approved (Acre-Feet) | Reservation Remaining (Acre-Feet) |
|-----------------------|--------------------------|------------------------------------|-----------------------------------|
| Custer County | 7 | 1,502.6 | 26,975.4 |
| Dawson County | 3 | 1,494.8 | 44,360.2 |
| Little Beaver | 23 | 1,176.1 | 11,596.9 |
| Prairie | 5 | 4,127.0 | 64,340.0 |
| Powder River | 18 | 6,022.5 | 7,657.5 |
| Rosebud | 5 | 440.6 | 86,562.4 |
| Richland County | 2 | 781.0 | 44,839.0 |
| Treasure County | 1 | 1,500.0 | 16,861.0 |
| Park | 1 | 500.0 | 63,625.0 |
| Sweet Grass County | 5 | 4,827.0 | 41,418.0 |
| Stillwater | 1 | 44.0 | 16,711.0 |
| Carbon | 2 | 253.0 | 22,423.0 |
| Yellowstone | 1 | 420.0 | 57,543.0 |
| Big Horn | 0 | 0.0 | 20,185.0 |

Use of reserved water has been greatest in the lower Yellowstone Basin, which has historically experienced more irrigation development than the upper basin. Much of the reserved water development in the lower basin has occurred in the Powder River drainage where water-spreading

projects are usually economically feasible. The upper basin has developed less reserved water because of higher development costs, and a shorter growing season combined with depressed farm prices.

In spite of the depressed agricultural economy, all fourteen conservation districts have been actively promoting the use of their reserved water. DNRC has assisted the CDs with a number of public informational and promotional efforts including preparation of newsletters, fact sheets, and brochures. Many districts have held public meetings or presented fair exhibits to spread the word on the availability of reserved water. Six CDs in the Lower Basin have used Renewable Resource Development Program funds in determining the economic feasibility for developing some of the lands for which water was reserved.

The development of irrigation reservations in the Yellowstone River Basin is an ongoing process. As required by statute, the Board must review the progress of the CDs in developing their reserved water by 1988 -- ten years after the reservations were granted. This review will require all reservants to demonstrate that the objectives of their reservations are being met.

Missouri Basin Water Reservation Proceeding

In 1985, the legislature directed the Department to coordinate a proceeding to establish water reservations in Montana's Missouri River Basin. A basinwide system of water reservations is felt to be a strong basis for claiming Montana's share of the Missouri's flow. Water reservations will provide comprehensive, basinwide planning documents for the future development of water and the protection of instream flows.

In view of limited financial resources during this biennium, the legislature specified a six and one-half-year time period to complete the process. During the current biennium, qualified applicants upstream of Canyon Ferry dam are preparing applications to reserve water. During the next biennium, applications will be sought from the balance of the basin. All applications are to be received by July 1, 1989. The Department and the Board will have until December 31, 1991, to evaluate the applications, prepare an environmental impact statement, hold public hearings, and make final decisions on the applications. Reservations granted by the Board as part of this basinwide proceeding will receive a priority date of July 1, 1985.

Funds were appropriated by the 1985 Legislature to assist the departments of State Lands, Health and Environmental Sciences, and Fish, Wildlife and Parks in preparing applications for water reservations. In addition, funds were made available to the Department of Natural Resources and Conservation to coordinate the proceeding and to assist interested conservation districts and municipalities upstream of Canyon Ferry dam in preparing their applications for reserved water. To facilitate the proceeding, the Department has hired a new staff member to coordinate the Department's activities and to work with other agencies and applicants.

To make the best use of the funding, the Department hired a consulting firm on behalf of interested municipalities and conservation districts to prepare their applications. Work is progressing on applications for seven conservation districts and six municipalities in the upper basin. Two draft applications have been received - one conservation district and one municipality - to serve as models for the remaining applications. These drafts have been reviewed by the Department and the consultant is now preparing the other eleven applications. All applications upstream of Canyon Ferry dam will be finalized before July 1, 1987.

The departments of State Lands, Health and Environmental Sciences, and Fish, Wildlife and Parks are actively developing water reservation applications. The Bureau of Land Management has completed preliminary hydrological work for inclusion in instream flow reservation applications on several upper basin tributaries. The Bureau of Reclamation and the US Army Corps of Engineers currently have no plans for reserving water upstream of Canyon Ferry dam. The Bureau of Reclamation, however, may submit an application for a project in the lower basin. No irrigation districts have indicated an interest in applying for a water reservation upstream of Canyon Ferry dam.

Other activities of the Department have included: assistance to conservation districts in conducting landowner interest surveys, conducting irrigable land and water availability studies, and contacting potential applicants in the lower basin.

Three water reservation applications have already been received from public entities in the lower basin. The City of Lewistown and the Roosevelt County Conservation District have applied to reserve surface flows and the Sheridan County Conservation District has applied to reserve groundwater. These applications will not be acted upon until all other applications in the basin have been received.

Clark Fork Basin Water Reservation Applications

Although there has been no legislative directive to complete a water reservation proceeding in the Clark Fork Basin, some public entities are pursuing applications to reserve Clark Fork water. Draft applications have been received from the Department of Fish, Wildlife and Parks (DFWP) and the Granite County Conservation District. The DFWP seeks an instream flow reservation for the mainstem and tributaries of the upper Clark Fork. The Granite County CD is applying to reserve water for two irrigation water storage facilities. These facilities would provide supplemental irrigation water on Lower Willow Creek and water for a new project on Boulder Creek.

In addition to the two pending applications, the Mile High Conservation District has hired a consulting firm to prepare a feasibility analysis for developing irrigation water storage facilities on tributaries of the Clark Fork. If a feasible storage site is identified, the district will apply for a reservation. The Department will include an assessment of this Mile High CD proposal in its Clark Fork impact statement should the district make an application. It is believed that, following hearings on the EIS and the contested case hearing on the applications, the Board will make a decision on these Clark Fork applications in December of 1987.

CHAPTER VI

POTENTIAL FEDERALLY AUTHORIZED WATER PROJECTS

Background

The water policy bill passed by the 1985 Legislature (H.B. 680) dealt with a diversity of water resource issues. Among them was the need to promote the development of Montana's water resources. The motivation for this interest was founded in an acknowledgment that prudent water development is essential to a productive Montana economy. Equally important, the legislature realized that putting water to wise beneficial use is an important means to establish a legal claim to water. In turn, such claims may be asserted as a legal right that must be recognized and protected in any interstate water apportionment.

In reviewing the state's water development efforts, the legislature noted that a lack of federal funds has severely limited new water project starts. Accordingly, the state must increase its efforts to develop project proposals for which congressional authorizations should be sought. In the interest of promoting needed coordination with the legislature on this matter the mandate for a biennial report on the state water development program was expanded by the 1985 water policy bill. More specifically, the statute now requires that "the report must identify and rank in order of priority the projects for which the department desires to seek congressional authorization and funding and the efforts the department will undertake in attempting to secure such authorization and funding" (Section 85-1-621 MCA). The following discussion represents the department's response to this statutory directive.

Potential Federal Project Authorizations

During the past several years, Congress has expressed a strong reluctance to fund projects that result in expanded irrigation development. On the other hand, there appears to be an increasing interest in efforts that focus on the needs of present-level development. Accordingly, the projects for which the department wishes federal funding authorizations largely fall into the latter category. The first priority project centers on resolving the water shortage problems in the Milk Basin. The next priority effort involves obtaining low-cost federal power for project pumping associated with existing irrigation development in the lower Yellowstone River. The final two undertakings have a similar priority to the Yellowstone River project and involve the rehabilitation of dams at two state-owned water projects, Hyalite near Bozeman and Petrolia near Winnett. Although other projects are being considered, they are in the early planning stages and details of the needed federal authorization strategies have not been developed. Thus, they are not included in this discussion of projects for which federal funding authorizations will likely be sought during the upcoming biennium. Nonetheless, the issues that are to be addressed in these latter studies are important to Montana and include water supply shortages in the Musselshell Basin and federal assistance in implementing water reservation projects.

Milk River Project

Present water shortages in the Milk River have placed severe hardships on all water users in the basin. These shortages will become even more acute when irrigators in Canada and on the Fort Belknap Reservation begin using their full legal share of the basin water supply. In the face of this situation, the Department, the Milk River Irrigation Districts, and the U.S. Bureau of Reclamation have undertaken a comprehensive planning program that has identified means to reduce the present and projected shortages. Among the actions involved are those of increasing water use efficiencies in the basin, intensifying water management activities, developing new water storage, and importing additional flows from outside the basin. A determination of which course of action to pursue before Congress

must necessarily await the completion of the planning studies involved. At this time, it is anticipated that such work will be concluded by late fall or early winter of 1987.

The strategy that is expected to be employed in securing the needed Congressional authorization involves the preparation of two separate planning reports. One centers on the alternative of importing water into the basin. The other consolidates findings from Rehabilitation and Betterment studies of the present water conveyance systems in the seven irrigation districts involved. Once these studies are finalized, the participants will determine what recommended plan will be submitted to Congress. Depending on the course of action selected, the sponsors can use one or both of the planning reports to present their case for federal funding assistance.

In general, the recommended plan would first seek to maximize the conservation of water on the existing irrigation projects and thereby minimize the cost, or eliminate the necessity of providing additional water for irrigators within the basin. Further, the recommended plan, whether it involves a basinwide rehabilitation and betterment effort, the importation of water, or a combination of both, will be submitted for funding in accordance with provisions of the Pick-Sloan Missouri Basin program as authorized by the Flood Control Act of 1944. Through the Pick-Sloan Program, irrigators would not be required to repay project expenses that exceed their ability to pay. There would be no interest charge and power for primary pump lifts would be provided at a rate of 2.5 mills per kilowatt hour.

Federal Power for Existing Irrigation Projects

The Pick-Sloan Missouri Basin Program, established under the Flood Control Act of 1944, included provisions to develop nearly one million acres of irrigated land in Montana. The plan included low-cost financing for irrigation projects and established a rate of 2.5 mills per kilowatt hour for irrigation pumping. Only five percent of the land planned for irrigation development in Montana has received federal authorization to receive these benefits. Much of the remaining irrigable land in the state has been developed without the benefit of federal financing and is currently irrigated using power costing ten to twenty times more than Pick-Sloan power. Because Montana's irrigators face difficult economic conditions and have not received the irrigation benefits promised under the Pick-Sloan Program, the state is working to obtain Congressional authorization for low-cost federal power to existing irrigation projects in the Missouri River basin.

The strategy that is being followed involves state coordination with conservation districts and the Bureau of Reclamation to obtain the technical assessments of existing projects needed to support Congressional Authorization of Pick-Sloan benefits. Since there is no established process for authorization of benefits to existing projects, the approach is to select a series of projects for a pilot effort. A group of six conservation districts in the lower Yellowstone River basin, working as the Lower Yellowstone Conservation District Development Committee, have selected three projects in their area as candidates for the authorization attempt. The committee has requested Water Development Program grant funding to cost-share with the Bureau of Reclamation for technical assessments of each project. Once the studies have been completed, the Committee will work with the project owners and the Department in order to formally request Congressional approval. If the effort is successful, the Department will use it as a basis for developing eligibility criteria for other projects in the Missouri River basin which may benefit from federal power acquisition.

Although this effort is innovative and involves uncertainty, it could provide a method for the state to obtain benefits which have long since been promised under the 1944 Flood Control Act. Federal power could provide a cost savings of as much as 30 mills per kilowatt hour for the electrical energy required for irrigation. Long-term benefits include price stability for electricity, since the federal power could be obtained at a fixed rate. Other benefits from federal project authorization could include federal technical assistance and low-cost financing for irrigation project rehabilitation.

Rehabilitation of Hyalite and Petrolia Dams

In February 1985, a feasibility study was concluded that identified the actions needed to bring the state-owned Hyalite dam into compliance with current state-of-the-art dam safety standards. A similar study, begun in July 1984, was focused upon a number of dam safety concerns with another state water project, the Petrolia dam. As a result of these studies, discussed in greater detail in Chapter VII, it was concluded that both structures needed rehabilitation. The estimated total project cost for the Hyalite dam rehabilitation, including construction, is about \$4 million. Rehabilitation of the Petrolia dam will involve an estimated project cost, including construction, of \$2.6 million. Funding for both of these efforts is being sought through a loan from the Small Reclamation Projects Program administered by the U.S. Bureau of Reclamation (USBR). This federal program can provide zero-interest loans to cover substantial portions of the project construction costs. Draft loan applications for the Hyalite and Petrolia rehabilitation projects have been forwarded to the USBR for review. It is expected that a final draft of the Hyalite application will be submitted in January 1987; at this time, a submittal date for the Petrolia application is uncertain. If approved by USBR, the loan requests for both projects would be submitted to Congress for final authorization.

CHAPTER VII

STATE-OWNED WATER PROJECT REHABILITATION

The State of Montana owns twenty-five water storage projects which provide water primarily for irrigation. Secondary benefits include recreation, flood control, and sediment accumulation. The two largest are the Tongue River Project in Big Horn County and Deadman's Basin Project in Golden Valley and Wheatland counties. These two projects have a combined storage capacity of almost 145,000 acre-feet. The following dam projects have spillways, outlet works, and drain systems that are deteriorating and in need of repair. Long-term remedies for particular site problems have varied according to dam condition.

During the four-year U.S. Army Corps of Engineers (Corps) Phase I dam safety inspection program twenty-two state-owned water projects were inspected. Twelve projects were declared unsafe, primarily because of inadequate spillway capacity to meet present dam safety criteria. To update these projects to meet present criteria, the Department is completing feasibility studies to identify a preferred alternative to pursue funding to rehabilitate the projects.

Besides ongoing long-term rehabilitation efforts, annual dam safety inspections have been made at all state-owned water projects since 1972. Because of these inspections, maintenance and repair needs are identified and plans are made to complete the necessary repairs. Minor repair work is completed by the water users, with the Department providing technical and field assistance. Major repairs are completed under the direction of the Department.

The Department is also required to investigate the feasibility of developing hydropower at all state-owned projects. If hydropower development is found feasible the Department will attempt to lease the site to public utilities or electric cooperatives. If another entity obtains the federal authorization to develop hydropower at a project, the Department will negotiate a lease with that entity. If lease is not possible, the Department is authorized to construct and operate feasible projects. The goal of hydropower development is to generate revenue to be returned to rehabilitation efforts.

SPECIFIC REHABILITATION EFFORTS

Broadwater-Missouri Dam (Broadwater County)

An Emergency Preparedness Plan for Broadwater-Missouri dam is being completed. The plan will outline the responsibilities of the dam tender and the Department during a dam emergency. Flood inundation maps are being prepared for the area immediately downstream. The plan will be reviewed by other government agencies and the water users' association.

Cooney Dam (Carbon County)

Large holes in the tunnel lining downstream of the gate have been reported in the past. Each year the water users tried to repair the holes with epoxy. In 1984 a new epoxy material was used for repair. The 1985 and 1986 inspections indicate the material is in excellent condition and is performing well. Only minor repair work has been required since.

Cottonwood Dam (Park County)

Inspection reports prior to 1979 reported an uplift of the center slab of the spillway floor. The cause of the uplift was investigated in 1982 and a report was prepared that outlined alternatives to repair the spillway. In 1986 a design was completed to remove the center slab of the spillway, remove the material below the slab and replace it with a free-draining gravel with drain pipes, extend the height of the sidewalls, install baffles in the chute, and replace the wooden flashboards with a

concrete guard dike. The total cost to repair the project is \$175,000 which includes the engineering design, construction management, and the construction contract. The work is expected to be complete in November 1986.

Flint Creek Project (East Fork of Rock Creek Dam) (Granite County)

During the 1985 dam safety inspection the emergency gate stem was bent. The Department hired a contractor in the fall of 1985, who straightened the stem in place. The cost for this work was \$2,900.

Fred Burr Reservoir Dam (Ravalli County)

For many years it has been recommended in the annual dam safety report that the outlet tunnel be relined because the concrete surface of the pipe is severely pitted and eroded. The water users awarded a contract in November 1986 to reline the pipe. The cost range for this work is \$5,000 to \$10,000. The Association has applied for a loan from the Department to complete the work. The work will be completed in the fall of 1987.

Frenchman Dam (Phillips County)

In 1984 the reservoir was emptied due to the drought. The Department had aerial photographs taken of the reservoir for the purpose of making a topographic map of the reservoir area. The topographic map was completed in 1985 and a new storage table was calculated. Over 3,200 acre-feet of storage (almost 50% of the original storage capacity) has been lost to sediment since the reservoir was constructed in 1952.

Martinsdale Dam (Wheatland/Meagher Counties)

The Department completed repair work to the spillway and construction of the seepage collection and monitoring system in the fall of 1985. The Department monitors the new drains on a biweekly basis during the spring and summer, and bimonthly during the fall and winter. The total cost for engineering and construction was \$264,000 and the project cost was financed through a Coal Severance Tax Loan and a state grant.

Horizontal drains were installed in both abutments of the North dam. The drains were installed at different levels and were drilled 150 feet into the abutments. A 300-foot-long interceptor drain was also installed below the right abutment. The seepage from the drains is collected in manholes for monitoring and then drained into the outlet canal and an existing stream channel. The existing toe drains were located and tied into the new seepage monitoring system.

About 100 feet of the existing concrete spillway in the right abutment of the East dam was replaced. Drains were installed along each wall and under the floor slab.

The Department is planning to construct an auxiliary spillway and provide a breach location in the supply canal to allow the project to route the Probable Maximum Flood (PMF). The auxiliary spillway will be 30 feet wide and located in the abutment of the East dam. The total cost for engineering and construction is about \$50,000, which will be financed through a Coal Severance Tax Loan and a state grant.

Middle Creek (Hyalite) Dam (Gallatin County)

A feasibility study of Middle Creek dam to bring the dam into compliance with current state-of-the-art dam safety design standards was completed in February 1985. The preferred alternative for rehabilitating Middle Creek dam is to raise the dam crest 10 feet, raise the reservoir level by 8.2 feet, rebuild the existing spillway structure and install a second spillway to channel the

water to Hyalite Creek, and construct a new emergency spillway in the left abutment. The estimated total project cost is about \$4 million. The Department has made a draft application to the Bureau of Reclamation for a Small Reclamation Projects Loan. The final application for the Small Reclamation Projects Loan is to be submitted in January 1987.

The Department is completing a fisheries study to determine the impact of the proposed project on the arctic grayling. The results of the study will be incorporated in the Environmental Assessment, which will be completed during the fall of 1986. The goal of the study is to investigate the spawning habitat of the grayling and suggest mitigation measures.

Nevada Creek Dam (Powell County)

The Corps' inspection report for Nevada Creek dam (January 1981) stated the spillway capacity is seriously inadequate by Corps Guidelines and subsequently declared the dam unsafe. As the first step in rehabilitating the project to current dam safety standards, the Department plans to begin an engineering prefeasibility study to determine if a complete feasibility study is needed. If needed, the complete engineering feasibility would begin in 1987 to examine alternatives to solve the safety problems at the dam. The estimated study cost is \$300,000.

An Emergency Action Plan for Nevada Creek dam is being written. The plan will outline the responsibilities of the dam tender and the Department during a dam emergency.

North Fork of the Smith River Dam (Meagher County)

The Corps' inspection report of May 1981 stated that the spillway is seriously inadequate by Corps guidelines and subsequently declared the project unsafe. As the first step in rehabilitating the project to current dam safety standards the Department plans to begin an engineering prefeasibility study to determine if a complete engineering feasibility study is warranted. If warranted, the feasibility study would begin in 1987 and would develop alternatives to solve the safety problems at the dam. The estimated cost of the study is \$275,000.

Painted Rocks Dam (Ravalli County)

The Department is planning to let a construction contract in the spring of 1987 to repair deteriorating concrete on the spillway sidewalls and the spillway floor. The work will be completed by the fall of 1987.

Petrolia Dam (Petroleum County)

The December 1980 Corps' inspection report noted that the spillway is seriously inadequate by Corps guidelines and declared the dam unsafe. Voids were discovered under the spillway slab and a large number of seepage areas were found downstream from the dam. In October 1982 an engineering firm was contracted to conduct a seepage study and preliminary stability analysis, and to determine the cause of the voids under the spillway floor.

Findings were:

1. The preliminary stability analysis showed the embankment is unsafe.
2. Seepage is exiting through both abutments and through the left abutment contact with the embankment.
3. The voids under the spillway appear to be caused by poor drainage.

An engineering feasibility study was begun in July 1984 to address the dam safety concerns identified in the Corps' report and the 1982 engineering study. The goal of the feasibility study is to find an economical repair alternative to bring the dam up to current state-of-the-art dam design standards. The major components of the study are: a detailed hydrologic analysis to determine the required spillway capacity, a geotechnical investigation to evaluate the stability of the dam embankment and spillway, a dam breach routing to verify the downstream hazard of the project, and an economic and financial analysis from which the Department can pursue funding. The study is to be completed by December 1986 at a cost of \$230,000.

The preferred alternative is to rebuild the principal spillway, construct an auxiliary spillway to the south of the principal spillway, construct an emergency spillway to the north of the principal spillway and raise the height of the dam by four feet. The estimated project cost is \$2.6 million. The Department plans to finance the project with a loan from the U.S. Bureau of Reclamation, a federal grant, and a state contribution.

The water users placed about 1,500 cubic yards of riprap on the upstream face of the dam in January 1986 to repair erosion damage.

An Emergency Action Plan is being written. This plan will outline the responsibilities of the dam tender and the Department during a dam emergency. The plan will also contain flood inundation maps of areas downstream that would be flooded if the dam failed.

Ruby Dam (Madison County)

The Corps' inspection report of August 1980 found the spillway capacity is seriously inadequate by Corps guidelines and subsequently declared the project unsafe. As the first step in rehabilitating the projects to current dam safety criteria the Department plans to begin an engineering prefeasibility study to determine if a detailed engineering feasibility study is warranted. If warranted, the detailed feasibility study would begin in 1987 and would develop alternatives to solve the safety problems at the dam. The estimated cost is \$275,000.

Wind and wave erosion have displaced some of the riprap on the upstream face of the dam. The water users are hiring a contractor to replace about 1,500 cubic yards of riprap to repair the damaged area. The work was completed during the fall of 1986.

The Emergency Action Plan was updated and distributed in the fall of 1986. The plan outlines the responsibilities of the dam tender and the Department during a dam emergency. The plan also contains flood inundation maps of areas downstream that would be flooded if the dam failed.

Tongue River Dam (Big Horn County)

The feasibility studies for the rehabilitation of the Tongue River dam are now complete. The feasibility studies addressed engineering, economics, environmental, social, and archaeologic concerns. These studies identified a preferred alternative which involves a four-foot increase in normal water surface elevation and widening the spillway to safely pass the Probable Maximum Flood (PMF) of 382,000 cfs. The preferred alternative is technically but not economically feasible.

Because the preferred alternative was not economically feasible the Department undertook the task of studying the following scaled-down rehabilitation options:

1. Modifying the spillway chute and stilling basin. This would allow passage of 103,000 cfs but not allow for passage of the probable maximum flood. Estimated cost for this work is \$24 to \$54 million.
2. Repairing and widening the downstream portion of the existing spillway chute & stilling basin which will safely pass 60,000 cfs (the original project design flow). Estimated cost for this work is \$20 million.

To satisfy a state goal to select the alternative that would result in the least cost to the state, a risk analysis is being performed. The objective of the risk analysis is to: 1. Systematically quantify the ability of the dam to withstand flooding. 2. Assess downstream damage costs due to flooding and a dam failure. 3. Determine the least cost alternative to repair this project. 4. Determine the potential loss of life if dam failure occurs. The risk analysis is scheduled to be completed by December 1986.

In the spring of 1985 the Tongue River Water Users Association awarded a \$40,000 contract to have the spillway wall and floor joints repaired, the portal of the outlet tunnel patched, the spillway floor slab joints sealed with tar, the damaged outlet tunnel repaired, and debris removed from the tops of the spillway side walls. In addition, the Department spent \$5,000 for the repair of deteriorated concrete on the spillway.

Yellow Water Dam (Petroleum County)

Past safety inspections have found the outlet conduit is in very poor condition. The Corps' inspection report of October 1980 commented about the deteriorating condition of the outlet conduit. In October 1982, an engineering firm was contracted to evaluate the condition of the conduit. Their findings were that the conduit should be replaced or relined immediately.

The Department decided to replace the deteriorated metal pipe with a 42-inch-diameter reinforced concrete pipe. The engineering design contract was awarded in July 1985. Construction was to be completed in two phases and under two separate contracts. Phase I construction was the excavation of the embankment and removal of the old pipe. The outlet tower remained in place. While Phase I construction was being completed, the engineering design for Phase II construction was being completed. Phase II construction consisted of installing pipe, constructing an outlet structure, cleaning the outlet gate, replacing the embankment, placing riprap on the upstream face of the dam, and seeding the disturbed area. The work was completed in January 1986. The total cost, including the engineering design, field construction inspection, and both phases of construction was \$170,000.

State-owned Hydropower Projects

The DNRC has completed feasibility studies on the hydropower potential of several state-owned water projects. A Federal Energy Regulatory Commission (FERC) License has been obtained for the Broadwater-Missouri Power Project. An archaeologic study, fish ladder study, and revised recreation plan were completed and submitted to the Federal Energy Regulatory Commission in compliance with the FERC license. At current power prices, none of the projects except Broadwater are feasible for the DNRC to develop. The Broadwater-Missouri Power Project appears feasible but may have unacceptable negative cash flows in the initial years. Further investigations to establish the economics are being pursued; a decision will then be made whether the state should proceed with developing the project.

In addition to the state pursuing hydropower development on its own projects, private development is also being investigated. Private interests have expressed a desire to pursue development of Ruby dam, Tongue River, Willow Creek, and Painted Rocks Reservoir of the state-owned projects. FERC Preliminary Permits have been obtained for these projects and, if appropriate, agreements providing the necessary property interests and an associated royalty will be negotiated with the interested parties.

CHAPTER VIII

SUMMARY OF PROJECTS PREVIOUSLY FUNDED BY THE WATER DEVELOPMENT AND RENEWABLE RESOURCE DEVELOPMENT PROGRAMS

A. Water Projects Considered for Grant Funding by the 1983 and 1985 Montana Legislatures

The 1983 and 1985 legislatures considered 145 grant applications for water projects. Graphs 8 and 9 on the page at the end of section A show a breakdown of these applications by applicant and project type, and show the number of projects that received funding in each category.

The following projects were approved by the 1985 Montana Legislature and received funds during the FY86-FY87 biennium:

| <u>Sponsor</u> | <u>Project</u> | <u>Amount</u> |
|--|--|---------------|
| 1. Swan River Youth Camp | Sewage Treatment Facility | \$444,100 |
| 2. Montana State Prison | Sewage Facility Expansion | 68,500 |
| 3. Montana Bureau of Mines and Geology | Groundwater Information Center | 100,000 |
| 4. Triangle CD | Saline Seep Reclamation | 100,000 |
| 5. Carbon CD | Streambank Stabilization-Willow Creek | 68,000 |
| 6. University of Montana | Riparian Vegetation Classification System | 85,000 |
| 7. Teton County CD | Groundwater Investigation | 100,000 |
| 8. Lewis and Clark and Jefferson Valley CDs | Stream Stabilization Project- Prickley Pear Creek | 100,000 |
| 9. Cut Bank | Sewer System | 50,000 |
| 10. University of Montana | Missoula Valley Groundwater Aquifer Assessment | 100,000 |
| 11. Stillwater CD | Saline Seep Reclamation | 80,000 |
| 12. Greenfields Irrigation District | Automation of Irrigation Structures | 17,000 |
| 13. Carbon CD | Streambank Stabilization-Cottonwood Creek | 19,000 |
| 14. Daniels County CD | Water Quality Monitoring-Poplar River | 90,000 |
| 15. Sheridan County | North East Montana Groundwater Study | 75,000 |
| 16. Treasure County CD | Irrigation System Reorganization | 17,000 |
| 17. *Saco | Water System | 41,000 |
| 18. *Private Association | Weed and Moss Catcher Purchase | 20,000 |
| 19. *Sheridan County Reserve Sewer District | Sewage Treatment Facility | 33,000 |
| 20. *Department of Fish, Wildlife and Parks | Reconstruct Gartside Dam | 100,000 |
| 21. *Government of Butte Silver Bow | Sewer Sludge Injection | 82,000 |

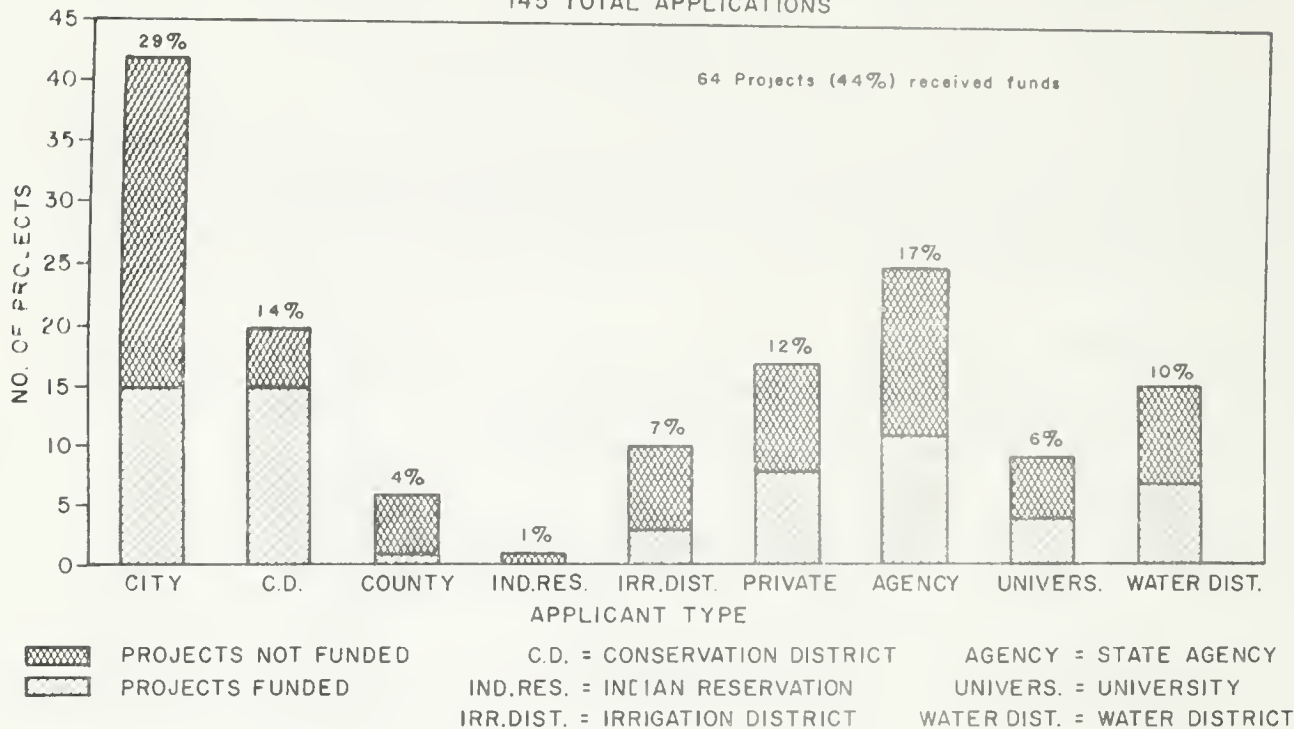
*If funds are available

**WATER DEVELOPMENT AND RENEWABLE RESOURCE DEVELOPMENT PROGRAMS
WATER PROJECTS**

APPLICATIONS CONSIDERED BY THE 1983 AND 1985 LEGISLATURES

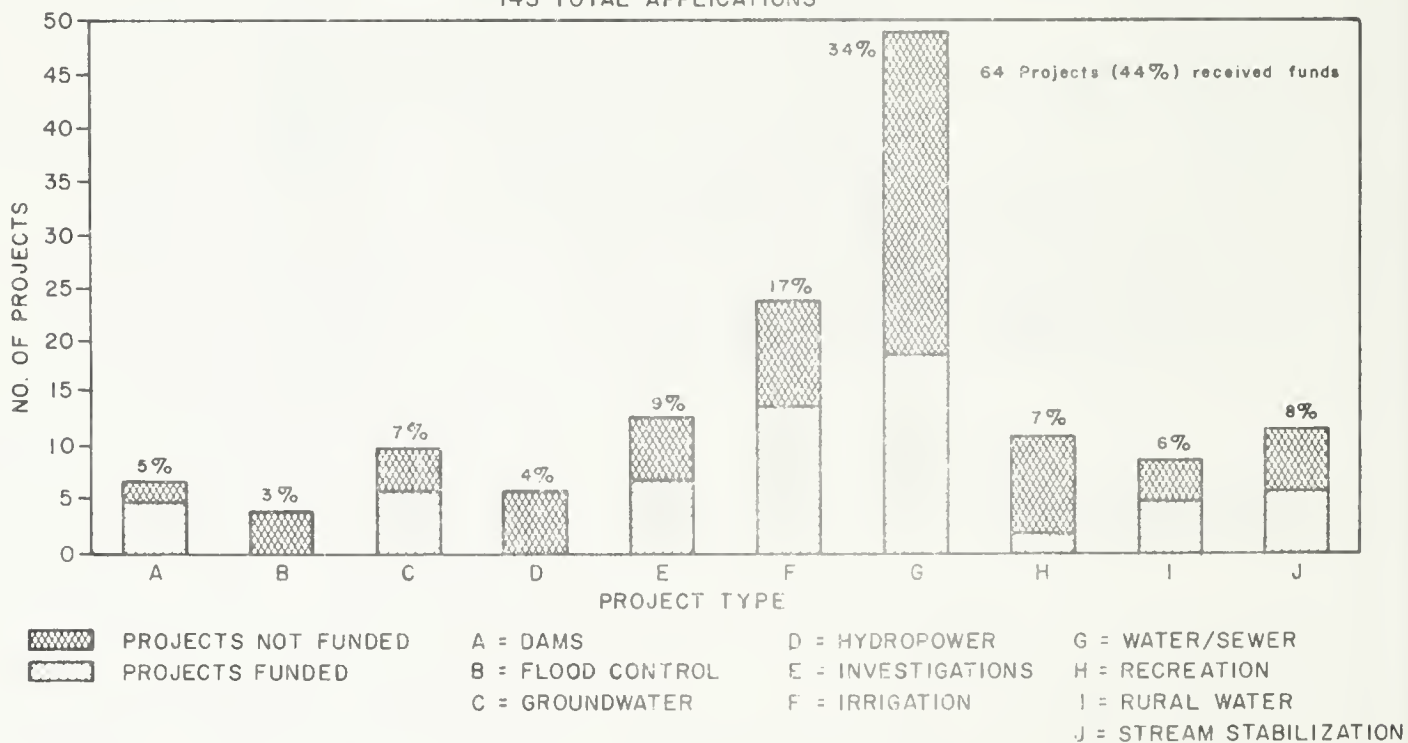
**GRAPH 8
BREAKDOWN BY APPLICANT TYPE**

145 TOTAL APPLICATIONS



**GRAPH 9
BREAKDOWN BY PROJECT TYPE**

145 TOTAL APPLICATIONS



Note: Percents at tops of columns represent percentage of total applications.

B. Projects Approved for Loans by the 1983 and 1985 Legislative Sessions

The 1983 and 1985 Montana legislatures considered 54 applications for Water Development loans over \$200,000. Graphs 10 and 11, which follow section B, clearly show that municipal water projects make up the largest percentage of project types, and that cities and water districts were the most common applicants.

The following projects were approved by the 1985 Montana Legislature to receive Coal Severance Tax loans during the 1986-1987 biennium:

- 1) Anaconda-Deer Lodge, a consolidated city-county government, received a \$500,000 loan at 9.29% interest for a 20-year term. The loan was used to partially finance the construction of a wastewater treatment facility to serve the City of Anaconda. The Environmental Protection Agency provided 75% of the project costs through a grant to the community.
- 2) The Cedar Park Rural Improvement District in Yellowstone County received a \$482,500 loan at an interest rate of 5.29% for the first five years, then 9.29% for the remaining 15 years of a 20-year term. The loan was used to finance the development of a new water supply for the area.
- 3) The Charlo County Water District received a \$34,500 loan at an interest rate of 9.29% for a term of 20 years to partially finance the rehabilitation of the District's 40-year-old water distribution system. A grant from the Montana Department of Commerce Community Development Block Grant Program completed funding for the project.
- 4) The town of Culbertson received a \$704,000 loan from coal severance tax funds to partially fund the construction of a water treatment plant. The town had been directed by the state's Department of Health and Environmental Sciences to bring its water system into compliance with the state's Safe Drinking Water Act. The loan has an interest rate of 5% for the 20-year term of the loan. The town also received a \$100,000 Water Development Grant and a \$100,000 loan from general obligation funds.
- 5) The town of Ekalaka received a \$195,000 loan at an interest rate of 7.29% for the first five years, then 9.29% for the remaining 15 years of a 20-year term. The loan was used to finance the renovation of the town's deteriorated water system.
- 6) The city of Fort Benton received a \$753,060 loan at an interest rate of 6.29% for the first five years, then 9.29% for the remaining 15 years of a 20-year term. Loan funds were used to make improvements to the municipal water supply by constructing a new infiltration gallery in the Missouri River.
- 7) The city of Havre received a \$2,590,000 loan at an interest rate of 6.29% for the first five years, then 9.29% for the remaining 15 years of a 20-year term. Loan funds were used to finance repairs to the supply, treatment, transmission, and storage components of the city's water system.
- 8) The Homestead/Oxbow Rural Improvement District in Yellowstone County received a \$758,000 loan to finance the construction of a central water system to replace individual wells and provide fire protection. The loan carries an interest rate of 5.29% for the first five years, then 9.29% for the remaining 15 years of the 20-year term.
- 9) The town of Judith Gap received a loan of \$100,000 at an interest rate of 7.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years. The funds will be used to

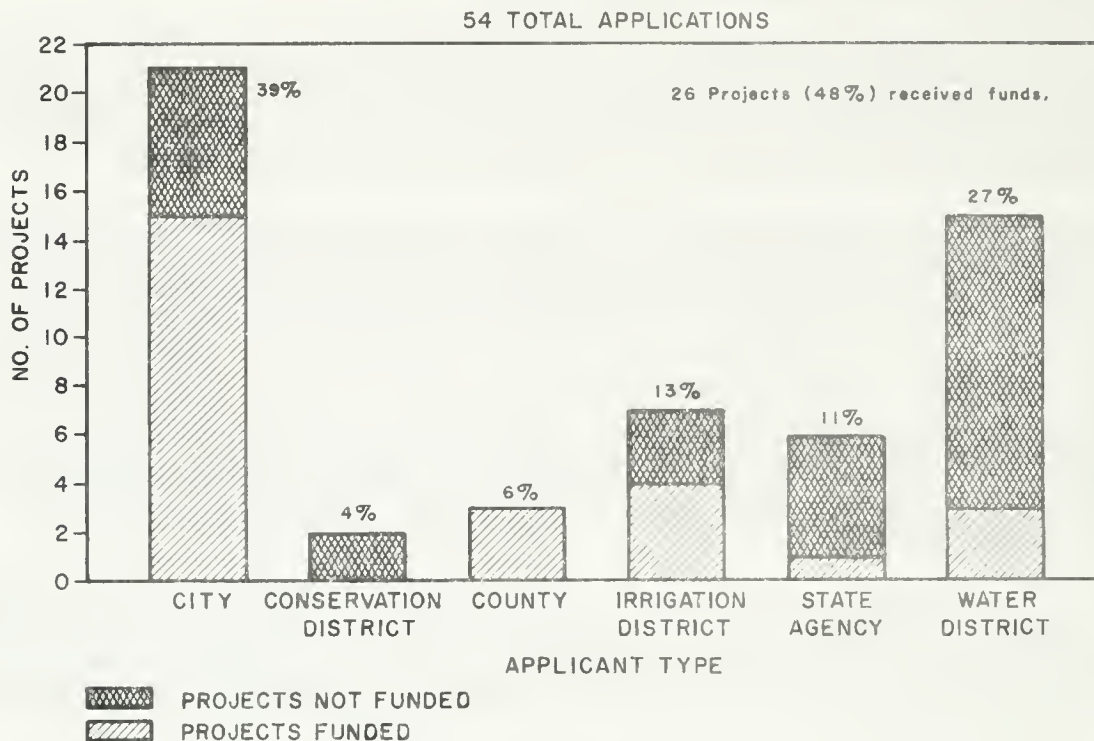
develop a new water system to replace the present system, which has been contaminated with gasoline.

- 10) The town of Poplar received a \$477,260 loan at an interest rate of 6.29% for the first five years, then 9.29% for the remaining 15 years of a 20-year term. Loan funds were used to partially finance improvements to the town's water system, including line replacement and additional storage facilities. The U.S. Indian Health Service and the Economic Development Administration have awarded grants to the town to complete the funding for the project.
- 11) The city of Three Forks has received a \$435,000 loan to finance improvements to their water system, which will bring the system into compliance with the state's Safe Drinking Water Act as mandated by the state's Department of Health and Environmental Sciences. The loan carries an interest rate of 7% for the first five years, then 10.118% for the remaining 15 years of the 20-year term.
- 12) The Martinsdale Project, which is part of the state-owned Upper Musselshell Project, is an offstream storage reservoir in central Montana supplying water to irrigators along the Musselshell River. Improvements include replacing the spillway and improving the stability of the main dam containing the reservoir. The \$250,000 cost of the improvements, with interest at the rate of 10.118% for the 20-year term of the loan, will be repaid by the irrigators who utilize the storage facility through a water user fee.
- 13) Cottonwood dam is a state-owned project in Park County. The project received a loan in the amount of \$30,000 at an interest rate of 9.29% for a term of 20 years. The reservoir supplies supplemental irrigation water to irrigators in the Shields River Basin. Loan funds will be used to replace part of the spillway floor and for other spillway repairs. The cost of the improvements will be repaid by the irrigators with a water user fee.
- 14) Yellow Water dam is a state-owned project in Petroleum County. The reservoir supplies irrigation water to irrigators in the Yellow Water Creek Basin. The project received a \$32,000 loan at an interest rate of 9.625% for a 20-year term. The loan funds will be used to replace the outlet conduit through the dam. The cost of the improvements will be repaid by the irrigators with a water use fee.
- 15) Big Fork County Water and Sewer District will receive a \$250,000 loan at an interest rate of 7% for the first five years of a 20-year term, then 10.118% for the remaining 15 years. The funds will be used to partially finance construction of a central sewage collection system and treatment facility as mandated by the Environmental Protection Agency.
- 16) The town of Dodson is authorized to receive a \$170,000 loan to finance the drilling and development of a new water well to replace their present well, which went dry in August 1984. The loan will carry an interest rate of 7.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years.
- 17) The East Bench Irrigation District (Gravity Irrigation System Project) is authorized to receive a \$1,650,000 loan at an interest rate of 3% for the 30-year term of the bond. The project will convert 6,000 acres from pumped sprinkler systems to gravity flow systems to reduce electricity and maintenance costs.
- 18) The East Bench Irrigation District (McHessor-Dry Gulch Gravity Irrigation System Project) is authorized to receive \$1,317,295 at an interest rate of 3% for a 30-year term; however, it is anticipated that the district will only need \$736,000. The funds will be used to develop a

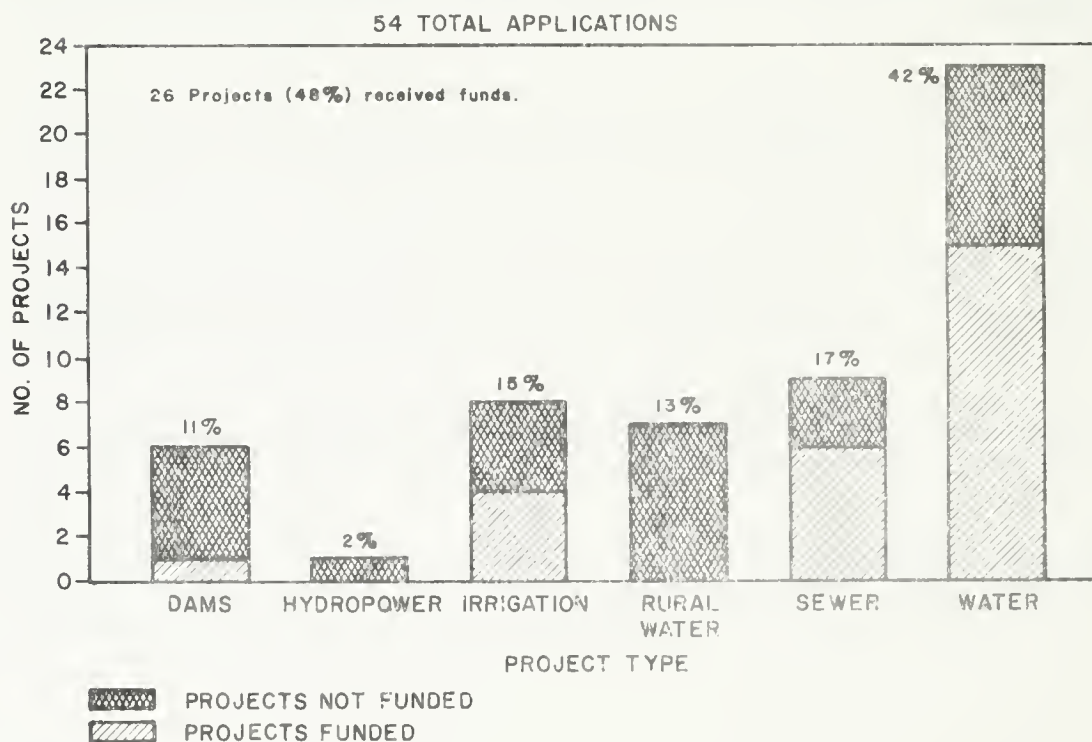
gravity sprinkler irrigation system through the installation of pipelines to correct inefficient water use, crop loss, erosion, and high energy costs.

- 19) The city of Glasgow is authorized to receive a loan of \$5,662,000 to finance the development of a new water supply from the Missouri River; however, it is anticipated that the city will only use \$3,200,000 of the funds. The new water supply will replace the current water supply, which is a series of wells with steadily declining yields. The loan will carry an interest rate of 5.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years.
- 20) Lakeside County Sewer District will receive a loan of \$1,190,000 to fund 25% of the construction of a central sewage collection and disposal system. Well contamination from seeping septic systems and surfacing sewage from failed systems have caused a public health hazard in the area, which will be eliminated by the construction of this project. The loan will carry an interest rate of 6.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years. The Environmental Protection Agency is funding the other 75% of the project costs.
- 21) Lockwood Irrigation District will receive a \$247,000 loan at an interest rate of 7.25% for the first five years of a 20-year term, then 9.29% for the remaining 15 years. The funds will be used to completely rehabilitate the District's water system, which is badly deteriorated and not adequately delivering water.
- 22) The town of Whitehall is authorized to receive a loan of \$300,400 to partially fund the upgrading of their sewage treatment facility to meet national secondary treatment standards. The loan will carry an interest rate of 7.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years. The Environmental Protection Agency is providing the balance of the project funds.
- 23) The town of White Sulphur Springs is authorized to receive a \$639,150 loan at an interest rate of 7.29% for the first five years of a 20-year term, then 9.29% for the remaining 15 years; however, it is anticipated that the loan will only utilize \$400,000. The funds will be used to finance the development of a new water source and to rehabilitate the present distribution system.

**GRAPH 10
BREAKDOWN BY APPLICANT TYPE**



**GRAPH 11
BREAKDOWN BY PROJECT TYPE**



Note: Percents at tops of columns represent percentage of total applications.

C. Renewable Resource Development Program - Non-Water Projects
Considered for Grant Funding by the 1983 and 1985 Montana Legislatures

The 1983 and 1985 legislatures considered 35 grant applications for non-water projects under the Renewable Resource Development Program. As shown by Graphs 12 and 13, which follow section C, state agencies submitted the most applications, and most projects competed for funding in the Agricultural Land Improvement category.

The following projects were approved by the 1985 Montana Legislature to receive grant funds during the 1986-1987 biennium:

Improvement to Agricultural Land Category

- 1) Toole County is using a \$46,000 grant to fund a cooperative weed management program in the Marias River Basin.
- 2) The Jefferson County Conservation District is using a \$46,000 grant to fund a cooperative noxious weed control program in Jefferson County.

Timber Improvement Category

- 3) The University of Montana Forest and Conservation Experiment Station is using a \$19,000 grant to fund demonstrations of full-tree thinning and tree removal methods.
- 4) The Department of State Lands is using a \$91,000 grant to make improvements to state-owned timber stands.

Water Reservations Category

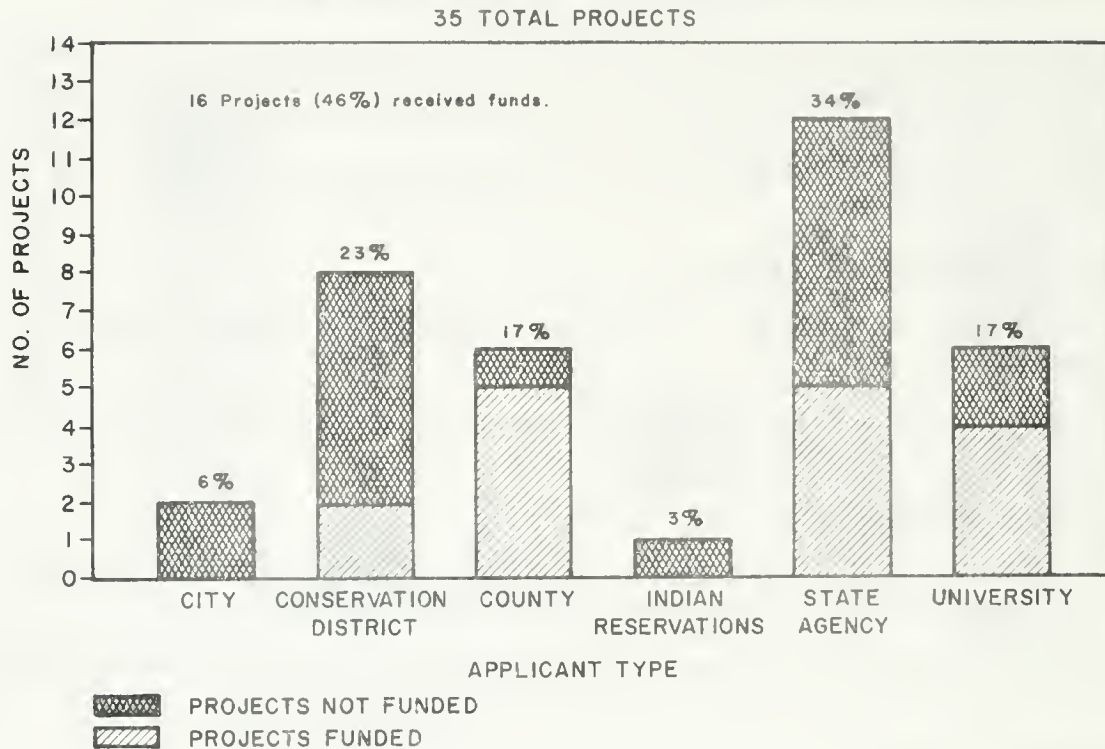
- 5) The Lower Yellowstone Conservation District Development Committee is using a \$25,000 grant to assist in the development of their water reservations on the Lower Yellowstone River.
- 6) The DNRC-Conservation Districts Division is using a \$70,000 grant to assist conservation districts in developing their water reservations.

Other Category

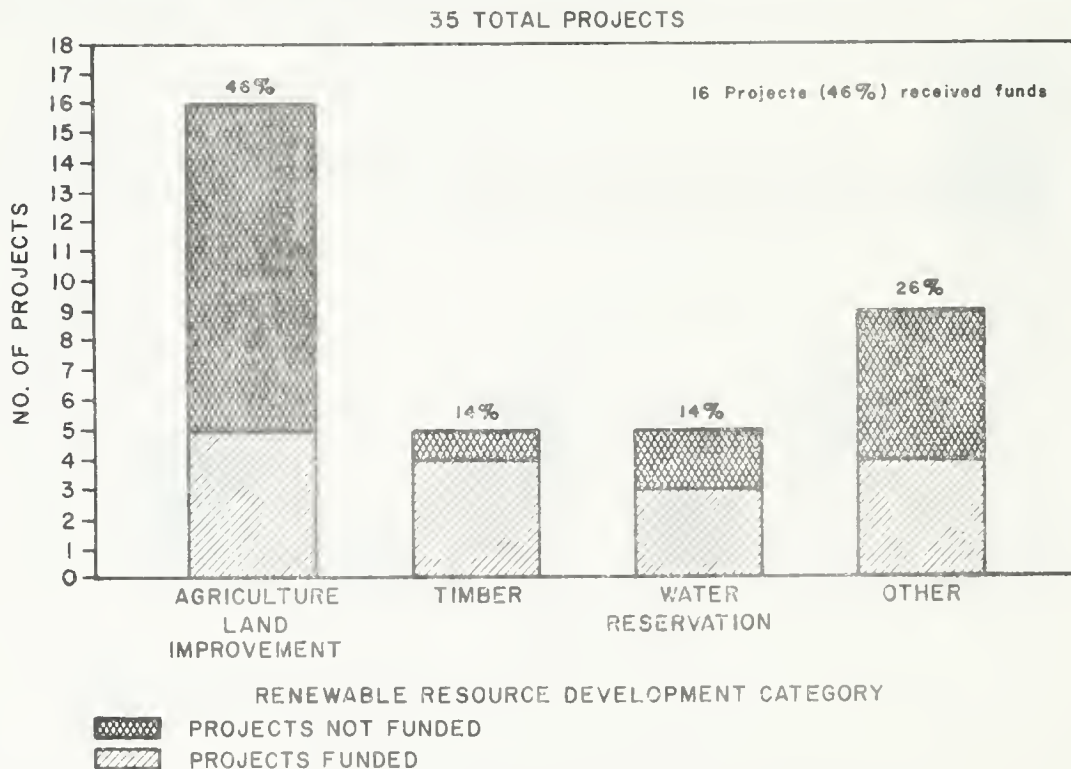
- 7) Gallatin County is using a \$70,000 grant to purchase bear-proof dumpsters for the West Yellowstone-Hebgen Basin Solid Waste Refuse District.

**RENEWABLE RESOURCE DEVELOPMENT PROGRAM
NON-WATER PROJECTS
APPLICATIONS CONSIDERED BY 1983 AND 1985 LEGISLATURES**

**GRAPH 12
BREAKDOWN BY APPLICANT TYPE**



**GRAPH 13
BREAKDOWN BY RENEWABLE RESOURCE DEVELOPMENT CATEGORY**



Note: Percents at tops of columns represent percentage of total applications.

APPENDIX A

WATER DEVELOPMENT ADVISORY COUNCIL

A Water Development Advisory Council (named below) was appointed by the Governor to review water development applications and assist in developing recommendations to the governor. The Council is established in accordance with Section 2-15-122, MCA. Members have contributed a great deal of time and effort to the program and the Department appreciates their efforts.

| | |
|---|--|
| Gordon McGowan, Chairman Highwood, Montana | Senator Bruce Crippen Billings, Montana |
|---|--|

| | |
|-----------------------------------|--|
| Bernard Harkness Dell, Montana | Representative Ted Schye Glasgow, Montana |
|-----------------------------------|--|

| | |
|---------------------------------------|------------------------------|
| Senator Ted Neuman Vaughn, Montana | Ken Kelly Helena, Montana |
|---------------------------------------|------------------------------|

| | |
|----------------------------------|-------------------------------|
| Fred Flanders Helena, Montana | Kim Wilson Helena, Montana |
|----------------------------------|-------------------------------|

Russ Brown
Helena, Montana

APPENDIX B

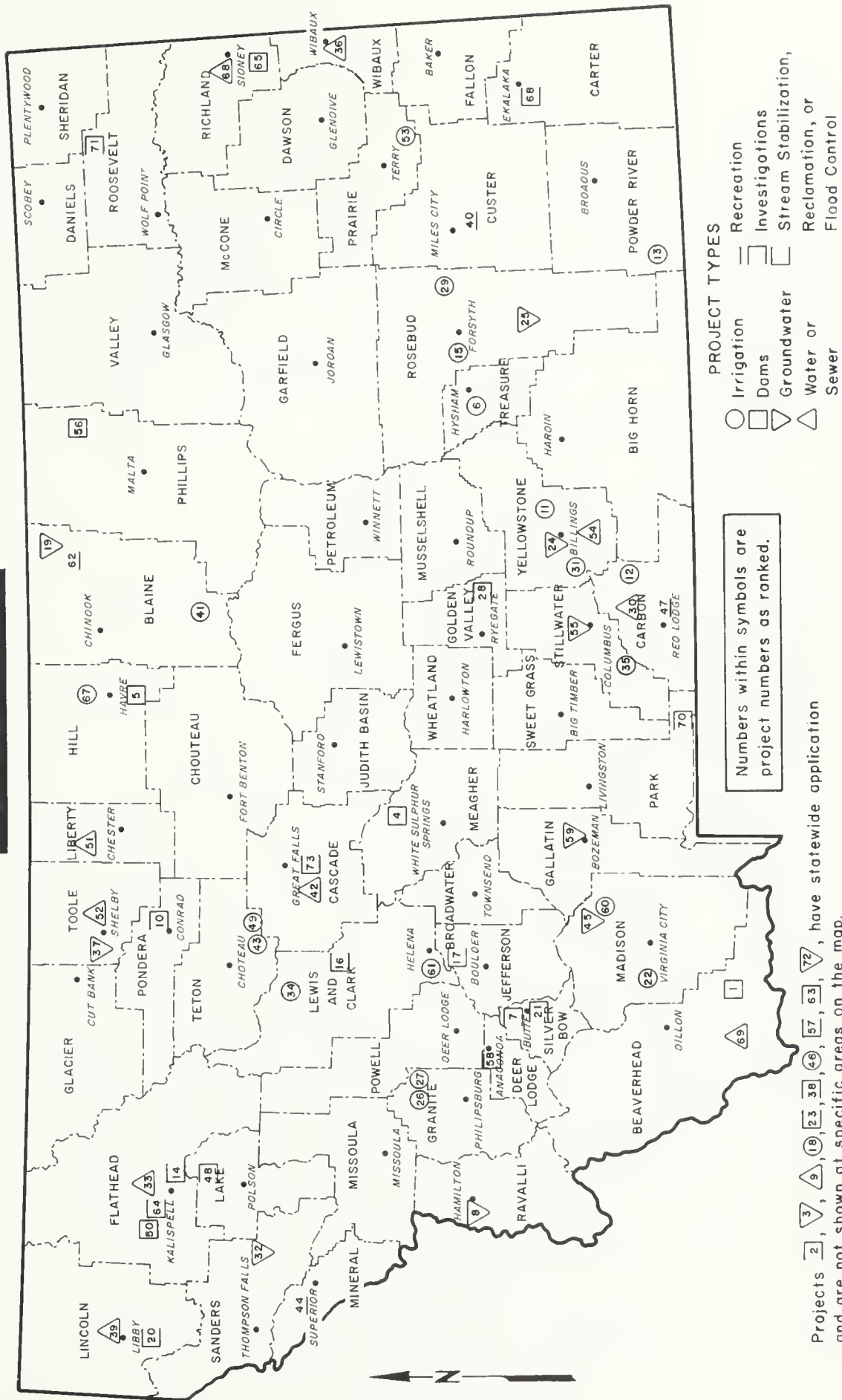
ACKNOWLEDGMENTS

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Geographical Distribution of Projects

Water Development and Renewable Resource Development Programs

WATER PROJECTS



PROJECT TYPES

- (W) — Community Water Systems
- (R) — Rural Water Systems
- (I) — Irrigation Systems
- (H) — Hydropower Projects

Renewable Resource Development Program

[illegible]

Improvement to Agricultural Land
Other
Timber
Water Reservations

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION



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